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ABSTRACT

The Second World Conference on Cooperative Education, held in April 1981, in conjunction with the Seventeenth Annual Meeting of the Cooperative Education Association in Boston, emphasized that the need to relate education and work is a worldwide concern. Summaries of the Conference's major presentations and selections from the rest are reproduced in this publication on international cooperative education to illustrate the commonality of the problem, the variables that must be dealt with, and the strategies used or proposed in different regions of the world. It was the consensus of the 1,000 representatives of industry, government, labor, and education from 34 countries who attended the conference that the traditional pattern of education--nine months on the campus followed by three months of vacation--is not meeting the education and training needs of all students equally well. Representatives from both developed and developing countries believe the following, as evidenced by conference presentations and meetings: (1) strategies for relating education and work should be incorporated into the education system earlier than university level--at the secondary level in developed countries and in elementary grades in developing countries; (2) changes in social mores would be necessary to encourage men and women to train for jobs rather than pursue liberal arts education; (3) government support will be needed to allow experimentation with curriculum to fit the needs of students and industry; and (4) the North American cooperative education models incorporate most of the elements that educators and employers believe essential. A list of conference participants is included in the Proceedings. (KC)

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"A Strategy for the Development of Human and Economic Resources"

PROCEEDINGS OF THE SECOND WORLD CONFERENCE ON COOPERATIVE EDUCATION

SPONSORED BY
NORTHEASTERN University
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APRIL 23 & 24, 1981

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INTRODUCTION

The Second World Conference on Cooperative Education held this past April in conjunction with the 17th Annual Meeting of the Cooperative Education Association in Boston emphasized in some dramatic ways that the need to relate education and work is a worldwide concern. Summaries of the Conference's major presentations and selections from the rest are reproduced in this publication on international cooperative education to illustrate the commonality of the problem, the variables that must be dealt with and the strategies either attempted or to be attempted in the different regions of the world.

In preparing to develop a conference that would be accurate in its focus and productive in its outcomes, the Conference's staff met with leaders of industry, trade unions, government and education representing both developing and developed countries from many parts of the world. In these visits, it became quite apparent that many respected organizations and people would be willing to contribute their knowledge and experience to further the development of the world's human resources. In most countries of Asia, Africa, Europe, Latin America, the Middle East and North America, there is no longer a question about the need to link education and work; the issue now at hand is developing implementation strategies to effect the changes required. And it was to this need which the Conference addressed itself.

The goals of the Conference were to:

- Identify the changes that are required in the perceptions and practices of industry, labor, government and education if the developing and developed economies are to achieve high levels of employment and meet their manpower requirements.
- Design workable and acceptable strategies for increasing the employment mobility of people and meeting the human resource needs of all nations.

It was the concensus of the one thousand representatives of industry, government, labor and education from thirty-four countries that the traditional pattern of education, nine months on the campus followed by three months of vacation each year, is not meeting the education and training needs of all students equally well. Perhaps it never has. One fact which became very clear is the need for change in the way education and training are delivered if the education system is to assure the employment mobility of men and women and effectively meet the human resource needs of business, industry and the professions.

While the level of employment is largely a function of the business cycle, the pockets of underemployed and unemployed men and women which exist in the face of a critical shortage of managerial and technological personnel reflect a growing gap between the employment needs of society and the outcomes of the education. Many of these underemployed and unemployed secondary and tertiary graduates do not have the credentials in terms of education, experience, confidence and self-reliance that persuades employers to invest in the graduates' potential.

In turn, employers, ever more convinced that the education system is failing them, institute their own training programs at a time of a growing unused capacity in higher education.

The experiences encountered in the development of cooperative education in North America are even more pronounced in other parts of the world. Because much of the world's higher education is similar to the English university system and has views towards career education encountered on some of the prestigious campuses of North America, effecting institutional change, needed to improve the education and training of young people, comes slowly. An illustration that such change can be accomplished is given by the director of the University of Malta.

Representatives of both developed and developing countries believe that strategies for relating education and work should be incorporated into the education system at levels earlier than the university. Almost all thought education and work programs should be an integral part of the secondary curriculum. Those from the developing countries suggested the primary level as the logical place to start since so few of their young people go beyond primary schooling. Furthermore, these countries needed technicians and tradespeople to operate and maintain equipment as much as they needed technologists and managers.

Changes in the mores of society would also be necessary to encourage men and women to pursue training skills rather than the classical education usually sought by those who hoped to go beyond primary and secondary schooling.

Government support will be needed to encourage experimenting with the policy and administrative changes needed to implement new views on the education of people. Also, financial assistance would be necessary to help bear the cost of these changes. Some even felt that the government should subsidize the cost to industry of initiating cooperative type programs. In many countries of the world, employers do not anticipate the economic benefits of education and work programs to the extent that North Americans do.

In many of the developing countries the scarcity of employers will hinder the implementation of programs for education and training of technicians, technologists and managers. In turn, the lack of these training positions limits industrial growth.

While it did not appear that any one approach for linking education and work was clearly superior, it did seem that the North American cooperative education models incorporate most of the elements that educators and employers believe essential. It is a proven system for increasing the employment mobility of men and women and for meeting the manpower needs of industry.

For students, the cooperative plan reinforces and expands learning, develops personal growth and provides career direction. By providing students with opportunities to apply theories and concepts in work environments normally encountered only after school or college, the cooperative plan, in effect, provides a series of laboratory experiences for students of all curricula. Through observing activities and behavior and inductively translating these observations back to theories and concepts, learning is increased and reinforced. Knowledge becomes a tool and education is recognized as more than merely a lot of content. Through the work experience students learn about interpersonal relations in the work place, supervision and meeting responsibilities. As a result, they become self-reliant and develop confidence in their decision making. The work experience also enables students to prepare for careers in a changing world. Through the cooperative plan students are able to test tentative career choices, learn of employer needs, select courses which will prepare them for careers of their choice and acquire pre-professional and professional level work experience. Through their exposure to the world off the campus students recognize at an early age the need for continuing education if they are to be mobile in periods of rapidly changing job markets.

For educational institutions the cooperative plan can play a significant role in their efforts to provide a superior education and more effectively compete for students in a declining student age pool. In some countries, cooperative earnings of upper-class students will enable institutions to use their own resources and external funds to assist larger numbers of new students to finance the first years of college prior to taking part in cooperative education. The post-graduate outcomes of cooperative students will strengthen the marketing efforts of the institution, thus enabling it to recruit both larger numbers and more able students. Full enrollments will assure the viability of the institution and its ability to retain a well-developed faculty.

Employers, especially in large corporations in North America, have long been familiar with the economic advantages of using cooperative programs for meeting their long and short-term manpower needs.

Cooperative education can also be a means to internationalize education as some of the presentations in the Conference clearly illustrated. Based on the comments of many participants, people left the Conference armed with education and training strategies for increasing employment mobility of men and women and meeting the human resource needs of society. Participants were fortified with the knowledge that the ideas they were carrying home were based on the thinking and experience of world leaders representing the constituencies most involved in effecting social and economic change. Groups frequently in adversary positions had created another communication link in resolving common concerns. Another step was taken in developing understanding between nations.

Northeastern University, in sponsoring the Conference, was carrying out a responsibility which it accepts as a leader in the field of cooperative education. Because Northeastern has always viewed the preparation of men and women for productive careers in a changing world as one of its major roles, it has made the cooperative plan an integral part of the University's educational process. Each year its staff of 100 professional and support personnel counsel and place 10,000 upper class students in paid experiences with 2,500 employers representing business, industry, government and human services.

The fact that preparations are already underway for a Third World Conference, to be sponsored by the Swinburne Institute of Technology in Melbourne, Australia in 1983, attests more effectively than anything else that the need for cooperative education-like programs are viewed as essential to the development of the world's human and economic resources.

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COOPERATIVE EDUCATION -- A POWERFUL INSTRUMENT FOR DEVELOPMENT AND PEACE

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It is an honor for me to keynote this opening session of The Second World Conference on Cooperative Education. I thank President Ryder for the invitation extended to me on your behalf. Within this important conference, educators and experts are providing an overview of mankind's renewed efforts to integrate academic study and work in the productive sector into a pattern and appropriate framework so as to accelerate the pace of regional and world development. The focus on cooperative education rests on developing human resources--perhaps the most difficult challenge for humanity today.

It is undeniable that the trends of world development are both uneven and marked with potentially grave dangers. Thus, within the past decade the rate of growth in the relatively advanced societies has slowed down. This is a contrast especially to the period immediately following the adoption of the Treaty of Rome in 1957 and the concurrent expansion of the Japanese economy.

Many of the world's poorer nations have also encountered severe difficulties, particularly those which must import nearly all of their energy supplies. Within the Western Hemisphere, fortunately, this problem is being significantly alleviated by OAS oil-producing members such as Mexico, Venezuela, and Trinidad and Tobago, who have adopted strategic measures for helping Central America and the Caribbean to adjust to the changing economic conditions.

At the same time there has been a historic shift in the factor prices for land, capital, labor and natural resources. With this shift has come a series of efforts designed to adjust the world economy to modern economic realities, with specific attention being paid to forging instruments for promoting both expanded tides of growth and social justice. One outcome of these new circumstances has been the insistence of the developing nations on creating a New International Order.

A key factor of these changing global conditions is the emergence of a broad group of nations into middle levels of development, notably so in Latin America, the Caribbean and in large parts of South East Asia. Over the next two decades progress within these societies may prove to be a major stimulus for revitalizing the world economy--provided they gain greater access to the advanced markets, improve integration trends within their regions, obtain access to better international financing, develop their energy and food resources and, in particular, forge ahead in the development of their human resources.

In all of this transformed world economic outlook perhaps the paramount need facing all nations and societies everywhere is the central importance of increasing their human capacities in relation to integral development: political, economic, cultural, technical and moral. To a major degree this means stepping up the process of training men and women in science and technology. But beyond and above this objective there is an even more important goal: developing national communities in such a way as to allow millions of human beings to participate more actively and directly in shaping their own future and that of the societies in which they are citizens.

Education, whether formal or informal, must adapt to the new realities. It is increasingly recognized that a broader yet more intense relationship must be constructed between educational systems and the national productive sector of each country. The particular strength of your conference on cooperative education is that your deliberations and discussions reflect quite accurately the current state of the art in these extraordinary world efforts to more effectively link up education and the workplace--through the integration of sound academic theory with the world of practical experience.

The technique of combining pure academic experiences in our universities and institutions of higher learning with periods of on-the-job training in the productive sector, constitutes a unique contribution of cooperative education.

The scientist or engineer emerging from such a cooperative educational program will be a better professional, highly trained yet with a true perception of the real needs of industry, able therefore to make a real contribution to the development of his country.

This, in my judgment, is an essential linkage which Latin America and the Caribbean must achieve if they are to become the dynamic center of the international community which their potential holds out before them. If we look at the American region, we see, I am convinced, an area with an unparalleled development prospect ahead. Its natural resources, especially for energy supplies, are only beginning to be sensed, let alone explored. Its food production and distribution capacities are fulfilling perhaps less than 30 percent of what they eventually will reach. And its marketing power--both within and without its own area--is substantially and rapidly improving. There are large constraints, both internal and external, on the region's ability to realize its projected potential but with creative domestic actions and cooperative international bargaining these could be reduced in intensity and variety.

However, with regard to its human resources capacities, Latin America confronts severe dilemmas. The bulk of its populations is below 20 years of age--a situation which will not change dramatically in the near or in the medium term. While less than 20 percent of its population may live in rural areas by the end of the century--a sharp decline since 1945--in absolute terms the area will have a greater rural population than at present. An evident lack of hospitals and health facilities is felt on the education and schooling process.Although more than 80 percent of its children enroll in primary school, fewer than 25 percent finish and about 5 percent of those eligible for college and university education actually receive this opportunity. As for research and development, finally, Latin America and the Caribbean invests less than one percent of the area's national product--in contrast to the United States where the comparable figure is 3.4 percent.

Despite these barriers which impede progress to develop human resources, Latin America and the Caribbean have nonetheless recognized the need to reduce the region's dependence on other cultures so as to promote its own scientific and technical progress. OAS members stress stronger national exploitation of natural resources through national control. Regional economic and cultural integration is being fostered so as to advance educational opportunities. Educational efforts are being substantially redirected so that they are more carefully attuned to the different cultures and productive systems of the Hemisphere, with emphasis specifically placed on education for social justice.

But Latin America is not only looking inward on itself. It recognizes, rather, that today, interdependence is the hallmark of the international community. Within the inter-American system this sense of world interdependence is felt at all levels and in every circumstance. Thus, the OAS now has sixteen Permanent Observers Missions from most of the nations of Europe, several from the Middle East--Saudia Arabia, Egypt and Israel--and from Asia. These OAS observer states cooperate with the Organization's programs especially in education, science, technology and culture. Through this inter-regional cooperation the OAS is making, we believe, a significant contribution towards stimulating common action leading to the New International Order.

OAS programs affecting human resources, it should be emphasized, are not found only in the fields of education and science but also in industry, labor and manpower planning. The primary focus of these efforts is on human resources, as evidenced by the more than 50,000 fellowships and scholarships granted under OAS auspices. Moreover, the Organization, while lacking the immense resources of the international financial institutions, also provides the small and middle-sized grants which enables its member states to prepare packages for large scale funding or universities and scholars to engage in vital and essential research projects. Over the past decade the OAS has expended more than $100 million in promoting projects in the field of science and technology alone--a sum multiplied many times over by even larger contributions from OAS member governments and financial sources. Thus, in one instance, small initial OAS funding for planning of an integrated rural development program led to total funding commitments of over $20 million and in the area of regional development the OAS imprint is clear and visible in the planning which has produced some of the region's vast hydroelectric power projects.

Human resources development is, of course, far more than a matter of planning, fellowships and finances. To be effective, rather, this process requires integrated cooperation between the public and the private sectors, between industry and the educational system. It is this objective on which your conference is centered and towards this objective the OAS devotes much of its time and attention.

Latin America is today one of the world's most attractive markets both for domestic and international business and industry. This attraction will increase dramatically over the next several decades. As private enterprise learns to accept the economic objectives set forth by OAS members, it makes a major and permanent contribution to the well-being of our societies.

However, governments on their part are obligated to set forth priority areas for investment, within national investment strategies. They must create conditions which enable business and industry to operate with efficiency and security.

The OAS is seeking to adjust its programs so that they enable the productive sector and the educational systems to work in tandem so as to provide effective ways for improving the human resources of its member states. These policies and programs necessarily vary from country to country but their overall objective remains the same: To enable human beings to realize their full potential, to open the door for new training opportunities and to better integrate the efforts of the public and private sectors for developing human resources.

We are not merely committed to this effort simply to promote education or training for its own sake--however laudable and essential this is and, in many circumstances, may be. We are, on the contrary, engaged in these activities so that the OAS programs may become the instruments whereby millions of human beings are enabled--through cooperation between educators and businessmen--to help perfect the societies in which they live. For this reason the OAS commends the work of cooperative education whose specific objectives coincide in various critical aspects with the general and broad technical assistance programs of the OAS itself.

The pursuit of justice and freedom are the central pillars of the inter-American system. Yet these objectives will not be fulfilled in abstraction but only as they inspire and motivate policies and activities which concretely improve the lives of human beings, especially those who have for too long lived on the margin of life and society.

Through its thoughtful, practical and thorough approach to integrating education and the workplace, cooperative education is helping to forge new instruments and programs whereby the needs of individuals, industry and society can be met in a more effective manner. It is thereby becoming a powerful force for enabling mankind to enlarge its pursuit of freedom and justice by striving to build societies where human talents and dignity are perfected and the aspirations of national communities--for growth and development--can be more effectively acted upon and fulfilled.

DEVELOPMENT OF HUMAN RESOURCES - AN INTERNATIONAL CONCERN FOR DEVELOPING COUNTRIES

Davidson Nicol
Under-Secretary-General, United Nations
Executive Director, United Nations Institute for Training and Research

I am honoured at having been invited to speak at this major and important conference in the presence of so many distinguished specialists from all over the world.

Our aims at this conference include the creation of a better understanding between nations through international education and encouraging the transfer and use of technology to developing countries by educating and training nationals in the use of that technology. Co-operative education, as we understand it, integrates academic work at the University with paid and structured work experience in industry, business and government and can play a major role in this transfer of technology. Co-operative education has been present in the universities of developing countries for some years in various fields as engineering, agriculture and, curiously, teaching and theology. Sometimes it was structured as part of the curriculum. At other times, it was both work experience and a means of support.

Some sharpening of definition is necessary--co-operative education is an integration of academic study and work outside. Both are integrated, a senior coordinator being necessary. It should be differentiated from simply working one's way through college but should not be excluded from it. The importance lies in the coordination and relevance.

With Third World nationals, these two may coincide in the most remarkable manner. The late Kwame Nkrumah, first President of the Republic of Ghana and Dr. Nnamdi Azikiwe, first President of the Republic of Nigeria - Africa's largest republic, both studied journalism and political science in Pennsylvania, and practiced their profession in the United States while studying. They contrived their own form of co-operative education which was to pay great dividends in their activities towards bringing freedom from colonialism to millions of their fellow citizens when they returned home to Africa afterwards.

In modern times, co-operative education should not necessarily be confined to the young of college age. It can begin with high school as three-quarters of the world's literate youth do not go to college. It can continue with the middle-aged although in this case there may be a reversal - periods of academic study especially for physicians and technologists for revision and updating being introduced into their routine professional work.

In some parts of the developing world, co-operative education as we know it, has been introduced but it is not yet as widely known and tested as in this country or this great University. There are certain barriers against adopting it at universities, stemming from the elitist concept. A certain fraction of college students might have been workers already and their entry into college constituted the culmination of their ambitions. They would be likely to regard interspersed periods of work as a waste of time and a retrogression. Other students may question its relevance unless it were quite definitely part of their course work and gained them credits toward their degrees or diplomas. The latter are documents which are of enormous economic value and provide passports towards upward social mobility especially in developing countries.

An awareness of these various factors makes it easier for the introduction of co-operative education into an institution. Co-operative education tests out the suitability of the student for his chosen profession quite early and if he or she is totally unfit, a change may be made early, saving time or loss of manpower which developing countries can ill afford.

Co-operative education can be a binding factor in nation-building. In a single African or Asian country, the distance between Boston and Philadelphia may traverse several communities speaking different languages. These communities are usually united by the language of the former colonial administration--for example English or a language derived from it. Krio is the lingua franca of the fourteen tribes or communities of Sierra Leone in a population of four million in a republic the size of Maine or South Carolina. Co-operative education which sends students to different parts of the nation away from their community helps to unify that country and to enrich their personal experience apart from enhancing their technological skills.

In some developing countries as Nigeria, a compulsory year of service is called for by the authorities after graduation to do work in a different part of the country. Service during the college years as part of their study may be a better answer, as it brings the young into contact with workers of a wider social range and technical skill. The student learns with them or from them, instead of the supervisory role a young graduate would have and which would expose him or her to a higher professional class. The presence of co-operative educational students may also be seminal. It may encourage workers to undergo further studies themselves, it may help them inspire their children towards acquiring further education and if the students are women, it will increase the respect of male workers towards women as co-workers and leaders instead of as sexual objects, child-bearers or a class apart restricted to menial or stereotyped forms of labour.

It is more likely that it is in technical institutes in the Third World that co-operative education will first establish itself. Developing countries lack the extensive industrial and business enterprises and large government facilities necessary for the education of students from many facilities and institutions. These countries also lack sufficient skilled manpower to supervise students. There might be resistence from the labour unions if the number of students is large and if the purpose of their presence is not explained. But if properly introduced their presence might be welcomed by some, as it might ease labour and management relationship later, if acquaintanceship between workers and professionals started when the skilled technologist as a student was not yet too knowledgeable or powerful. Developing countries need leaders who can mix on the factory floor, the workshops, the laboratories and offices with those less educationally privileged and by so doing, help to lift the level of the society and prevent those manifestations of social unrest, which may lead to political extremism on the one side and bourgeois elitism on the other.

Changes need to be made in the length and nature of the educational system so that concerned government and educational authorities do not feel that the period spent during college years in industry, business and government may lead to a diminution of the academic content of their work. In lengthening the course, the period spent outside the university has to be productive, as well as educational, since the governments of most developing countries are too poor to extend, without sufficient reason, the undergraduate period of their students, most of whom are on government scholarship.

This is where a combined approach by government and the local transnational corporations present in that country can be most helpful. Transnational corporations, as a rule, in the past have not shown much enthusiasm in the transfer of technology to developing countries. They prefer to export raw material to their home countries or to another surrogate country, processing them there, and generating employment and development abroad before sending the finished product, whether chocolate or steel, back to developing countries and re-selling them at higher prices. This is one of the reasons why OPEC countries and other developing countries with similar commodities, raise their prices or engage in ceaseless North-South dialogues on the prices of commodities, because they are now asked to pay sometimes up to ten times the cost of the finished imported products as they did in the early 1960's.

Some use could be made of some institutions or tertiary education as technical institutions, colleges or universities by transnational corporations by shifting some of their factories or refinement processes to developing countries and training students for managerial positions in their technical departments as well as employing other levels of labour. It would probably generate more employment in developed countries by increasing the buying power of the developing countries for more manufactured products of the former.

Certain educational changes lead us to believe that the introduction of co-operative education is ripe in certain fields in developing countries. Instead of giving basic degrees in general science subjects, before specializing or entering teaching, usually the only available (though indeed very essential) field, students can now embark in their undergraduate years straight into technological fields as petroleum engineering and food technology. These are fields which cry out for co-operative education methods rather than the classical type of higher education and this can be the vanguard of this growing type of higher education.

In 1972, the University of Ibadan, Nigeria, one of the most prestigious in Africa, embarked on the co-operative system of education. Petroleum Technology, Agricultural Engineering and Forestry Engineering were the first subjects introduced as undergraduate courses. The philosophy of this Institute of Applied Science and Technology was to apply a modified form of the co-operative system. The University has an industrial advisory council with members from the University, government agencies and industry and it has internally an office of coordination. They help to place individual students in suitable firms. Work experience is gained not only during the long vacation term but during the second term of each of the third and fourth years as work terms. The Canadian experience at Waterloo and Calgary Universities was fruitfully drawn upon.

International aspects of co-operative education were partly discussed earlier in this statement when further cooperation with transnational corporations was urged. But there is the broader field of international student exchange. Students from developing countries can benefit educationally from a semester or a year abroad and by mixing freely and socially with local students and workers there.

An organization called AIESEC took exchange students in Economics from many countries to work in business establishments in other localities and encouraged them to come to Africa, as did also African students from different universities. In a similar way, colleges and universities in the United States have sent their students for a semester or a junior year abroad. When their subjects are carefully chosen and matched, these two activities may be described as a form of co-operative education. Fifteen years after ending a career as President of an African university, I still meet these overseas students from outside Africa who studied in Africa working now as leading members of their communities in Europe and North America--in government, industry, education or international organizations, using skills, some of which they gained as students in Africa through studying with African students and under African professors. They have a firmer grasp of economic reality, a broader appreciation of international affairs, and an absence of arrogance, all leading to an ability to negotiate with the Third World being present to an unusual degree in their attitudes.

An international extension of co-operative education can produce, all over the world, sensitive leaders and ambassadors of peace who can transform their youthful experience and vision into endeavors which will certainly lead to international peace and understanding, in a world which is thirsty for global happiness and security.

THE DEVELOPMENT OF HUMAN RESOURCES: AN INTERNATIONAL CONCERN FOR DEVELOPED COUNTRIES

Shirley Williams
Organization for Economic Cooperation and Development

When Davidson Nicol was speaking I was reminded of my first experience with truly cooperative education many years ago in Ghana, in the time that Dr. Nkrumah was the president of that country and when it had just achieved independence. I always remembered being dropped off at a village, Mam Pong, on the ridges of the Gar Peninsula and discovering that I was engaged in cooperative education and that most of my students had walked 15 to 20 miles through the bush in order to take part in an educational experience.

From that day I was ashamed by the degree of motivation and the hunger for education of people less fortunate than those in the developed world, people who still know that education is the gateway to a different future for themselves and their children in a way that many people in the richer countries simply have forgotten.

What I propose to do today is to engage in a kind of tour-de-raison of what is happening in the developed world, in the very broad sense of cooperative education. I hope you will bear with me if my search takes me back into school and on into apprenticeship as well as looks briefly at higher education. Perhaps only in respect of this overview do I have anything useful to contribute to your conference.

Education is coming under extreme pressure partly because of the dissatisfaction increasingly registered with it and with the state of schools in particular in many developed countries. In my view this dissatisfaction, which is so noticeable in the U.S., but also exists in Western Europe, Canada, and other countries, arises at least in part from the fact that we are confronting a level of unemployment and specifically a level of unemployment among young people in the developed world, the like of which we have not seen since the Depression years between the two world wars.

The figures are frightening ones. In the OECD (Organization for Economic Cooperation and Development) countries (the U.S., Canada, and the developed countries of Western Europe), the number of unemployed people was 23 million at the end of 1980. It is estimated to leap to 26.5 million in the middle of 1982.

The range of unemployment rates in the OECD countries goes from the 5.5 percent of Germany, which, despite that low figure, is showing signs of rapidly rising unemployment, to the 10.5 and 11 percent of the United Kingdom, Spain, and Italy.

But that is only to begin to describe the situation. Those figures, bad as they are, are better than the figures for youth unemployment.

Among young people the figures expected in 1981 range from 14.5 percent in the United States, 16.5 percent in the United Kingdom, and 17.5 percent in France to 30 percent in Italy and 35 percent in Spain. We are looking at a situation in which one in three young people between the ages of 16 to 24 has no job and has very little prospect of getting a job. Even that does not spell out sufficiently how serious the position is. That is a general figure for young people between the ages of 16 and 24. But among young people who are unqualified, who lack educational attainment, who have no degree, who have not completed their 18-year-old public examinations, the figure can be doubled. Among those who are unqualified, among those who belong to the black community, among those who live in innercities, the figures can go as high as 40, 50 and even 60 percent.

I suggest that figures of 40, 50 and 60 percent unemployment among young people in innercities suggest the possibility of a breakdown of social trust and social order which we have got to take more seriously than by building up police forces to cope with the inevitable consequences.

Now that really new position of unemployment has been visited upon the young in part because adults are very much better organized to fight back than they used to be in the era of the Franklin Roosevelt or in the era of the governments of the 1930's. And it is this very high level of unemployment among young people that has been one of the reasons why the parent generation has become so much more critical of the school.

This is the second proposition I want to put before you. Within the schools, there is endless criticism of the quality and relevance of education. In the United States, there has been a consistent decline in the scores in Scholastic Achievement Tests (SAT). In Western Europe, there has been the endless emphasis on examinations and on basic skills of reading, writing, and mathematics. There have been the endless unfavorable comparisons between one country and another.

And there has been the attempt to go back to what is sometimes called fundamental education--persistent testing, assessment, and more examinations--in a desperate attempt to try to correct and then reverse what too much of our community sees as being, I believe unfairly, a failure of the schools.

The schools are tested by their ability to prepare youngsters for work. In societies running out of work more and more schools are unable to pass or achieve that criterion. So now growing out of these two forces, rising youth unemployment and rising dissatisfaction with the schools, is a desperate attempt to search about for a new approach, one that will be more relevant in terms of the post-education route of work and one that will fit children better for the new pattern of the economy.

Before I look at that new pattern of the economy and at the attempt to achieve a closer marriage between the world of education and the world of work, let me add one more factor to the grave situation that we face.

Whatever the reasons, and there are many, all of us must be aware that the major move back to conservative financing and to cuts in public expenditure in the western world is going to mean less employment in fields like public administration, education, and health, the fastest growing fields of employment in Western Europe and the United States during the last 10 years. In addition, it is going to mean pressure on the educational system to spend its shrinking resources more effectively. What Proposition 2½ has done to Boston, what Proposition 13 had done to California, what the new conservative financing has done to the government of the United Kingdom and will be doing shortly to the government of the United States, will exacerbate the situation I have outlined in a way that will make it more essential for people like those of you involved in this conference to try to bring about more effective bridges between education and world outside it.

There are some extremely interesting developments. On the one side there is the attempt by the traditional education system--schools, further education, higher education--to hold out a hand to the world of industry and the world of work. On the other side there is an attempt to embody a greater element of education, much of it remedial, in the traditional pattern of apprenticeship and industrial training, in an effort to make good some of these shortcomings of education, especially for less qualified boys and girls.

In Europe, these two streams have been kept virtually segregated from one another for many decades.

There was the traditional pattern of education. Schools leading on to public examinations, leading on to a formal classical higher education, of the kind that Dr. Nicol outlined to you in his remarks, were separate from the world, the shabby world, of the industrial or agricultural worker. This segregation led on to the professions, to the civil service, and increasingly to work in the media, all of which were respectable, aristocratic elite occupations which enabled young men and, more recently, young women not to soil their hands with the ordinary business of making and creating products.

And on the other side, the aristocracy of manual work, which meant the apprenticeship leading to the craftsman, leading at best to the status of the skilled workman or skilled workwoman who was in turn the aristocracy of that separate world of labor. And the two rarely mixed. In addition, we have a different tradition in the United States, one upon which many of you have built, the tradition of the boy and girl in the neighborhood school who worked their way through school and then through college by taking summer jobs and part-time jobs. Uniquely in the Western world, the American and Canadian traditions were ones in which to work and to be in education at the same time was not regarded as a distraction from the nature and the quality of education. But both systems together have indeed fostered attitudes among teachers which take pride in being remote from the world of work.

Both systems together have created school curricula which have had little place for making students familiar with an industrial or agricultural society. Both have developed systems of school government which have rarely included representatives from industry or the trade unions or agriculture among those serving on school boards or the governing bodies of schools.

Only recently we have seen the development of more open systems of education. First there has been an attempt to introduce into school curricula a greater understanding of society and of the role of industry and technology within society. There has been a ready acceptance of the need for much earlier vocational guidance, starting as young as 12 or 13, so that boys and girls have an opportunity to think about what their education's purpose is, and what they are going to use it for. There has been a greater acceptance of work experience, starting in many European countries now at the age of 15 or 16 to give boys and girls in their last two years of compulsory education several weeks of working in a factory, an office or a farm so that they get some sense of the behavior patterns and disciplines of the world of work. There has been a growing attempt to introduce industrialists onto the governing bodies of schools.

There has been specific experimentation in fields like the alternative school movement in the United States, much of it directed at the school-tired or at the potential high school drop out. Here in Boston, there has been the interesting experiment of the cooperative educational work under CETA (Comprehensive Education and Training Act) of energy-based work in jobs and energy-based courses in school. In Denmark the continuation school often is based around a training in a skill such as furniture-making, farming, or fishing, so that the child in the continuation school, typically a boarding school, gets experience of actually sustaining his or her own livelihood.

In England, community schools have developed in which space is made available for such community activities as old people's clubs, underfive clubs, community meetings of neighborhood groups, and even including adults in ordinary school classes so that they can share in the education experience of their own children.

The U.S. community college, one of the most open-ended systems of education both in terms of generational limitation and in terms of qualification limitations that anybody has seen in the educational world, has developed. In quite a different sphere industrial training has begun accepting a greater role for education. The most advanced system of industrial training anywhere in the world exists in the German-speaking countries of Europe: West Germany, Switzerland and Austria. It is a striking fact that 92 percent of school leavers in the German-speaking countries move on immediately to systems of apprenticeship that last for as long as three years and combine vocational education with working as an apprentice in a factory or other work place.

It is not surprising that West Germany has by far the lowest level of youth unemployment of virtually any industrial country in the West. I believe one of the most crucial reasons for that is that West Germany, Switzerland and Austria are unique in having an effective system of transition from school to work so that young men and women literally are training for the jobs that they will later have.

Yet, West Germany has found that much of that training is too specific to a single skill and for moving toward the multi-faceted forms of industrial training demanded by new technologies in all our countries. It only will be possible to move up-market in newly industrializing countries if we adopt multi-faceted forms of educational preparation and industrial training in all our countries.

In short, we must no longer train boys and girls for a single profession or a single skill but rather give them the foundation upon which they can come back to education time and time again in the course of a lifetime.

In Britain, a more recent experience has been what is called youth guarantee in which any young person who is unemployed for more than six months after leaving school is guaranteed the right to take up a short industrial course combined with basic education for six months. The aim of that is to try to prepare unemployed boys and girls more effectively for the world of work. Although this scheme is in many ways elementary, it is striking that boys and girls who go through even this relatively elementary form of vocational preparation get a job at the end of it in 80 percent of cases. The figure for those without that vocational preparation is less.

All of this brings me to two last subjects I want to touch upon. The first is higher education. And as Dr. Nicol has already forcefully said one of the great problems about higher education, especially, dare I say, in the Ivy League universities of the United States, in the great traditional universities of Europe, and in the universities established in the developing world which followed that pattern, paradoxically, is their own excellence.

They are so good at what they do well that they often find it almost impossible to change. If what they do well is no longer wholly appropriate to the world of which they are part, then their very goodness makes it more difficult for them to change.

My own university system in Britain has resolutely clung to the concept of the three-year degree for 18- to 21-year-olds, a job it does excellently with very low wastage rates. Only about nine percent of students fail to get a degree after a three-year course, a remarkably low rate.

But for that very reason, it is almost impossibly difficult to get the universities to take seriously the responsibility of educating people older than 21, the responsibility of accepting their responsibilities towards people upgrading their skills later in life, the responsibility towards adult students coming back through the open university systems, and indeed the responsibility to open up their great resources to the communities of which they are part.

And despite my unbounded admiration for the Ivy League universities of the United States, I find certain things in common between the great universities of Britain and the great universities of the East Coast of the United States. How does one change the higher education system? All sorts of exciting things are happening. In France paid educational leave has been adopted increasingly as a right for people working in industry to come back and upgrade their knowledge and their skills. The British experiment of the open university now extends to the idea of an open technical college so individuals not able to attend institutions of higher education can learn through open learning and by association with tutors on an individual basis.

In Germany young men and women who are past their 18-year-old university entrance examinations are going into apprenticeships before they go on to universities, a very interesting experiment in a country with very strict and in many ways rigid traditions of university education.

There has been the sandwich course which you are discussing here at this conference. Therefore, we are seeing all kinds of developments in higher education towards bridging the world of education and the world of work.

Let me end by saying this about the philosophy behind what we are talking about: If you look at the Western world, you will see as a fundamental pattern of our thinking that we have based our accountancy practices, our technology, our engineering, and our economics on one single concept--the concept of substituting capital for human resources wherever possible, replacing men and women with machines--for about a century.

We are a capital intensive economic structure, so much so that we have taken to the developing world, to countries with hands and brains and very little capital, our own capital intensive structures.

We have built green fields, turnkey plants, major hydro-electric projects and capital intensive factories. We have taken to them the technologies they can least do with and taught them nothing about the technologies that they most basically need. Now, as we in our own societies face the abundance of one resource--manpower and womanpower--and a growing scarcity of other resources--energy, raw materials and land--we need to learn from the developing world something about appropriate technologies, something about the development of human resources, something about accounting for human assets, something about questioning our own persistent obsession with replacing human beings with almost anything else because we are energy wasteful, land wasteful, raw material wasteful and human being wasteful in the West.

I believe that what cooperative education has behind it--the philosophy of first and foremost developing our human assets to the limits of which they are capable and conserving those things out of which the world is running, such as energy, land and raw materials--is the basic philosophy through which the concept of cooperative education has a very great deal to give the whole of the world, not just the developing world, but the developed world which has so much to answer for in terms of pursuing very wasteful economic and technological doctrine.

DEVELOPING COUNTRIES' RESPONSE
DISCUSSION PANEL

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Dean of Engineering, University of Petroleum and Minerals
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DR. YACKOVLEV: Ladies and gentlemen, welcome to this First Working Session of our General Introductory and Opening Session of the World Conference. We have with us four distinguished panelists who are ready to share with you some thoughts and ideas from their own experiences, either from their national backgrounds or from their respective sector in which they carry out their activities. I will request Mrs. Ursula Gittens, who is a labor representative at the Embassy of Trinidad and Tobago, to make the first presentation.

MRS. GITTENS: I am naturally going to be labor oriented because I've been a woman in labor for the last twelve years. I was President of the Civil Service Trade Union in my country, and I've been a labor attaché in Washington.

Cooperative education is particularly important in developing countries. We, in our small way, have been indulging in it for some time now.

The question of cooperative education, while it is important to developed countries, is particularly important in developing countries. And Dr. Nicol made a very important, a very vital comparison, which did not go unnoticed, when he referred to the question of people who had gone through this cooperative education process, professionals, that later on were better able to cope with people in the work place, and there was this lack of arrogance and all of that sort of thing. Now we, in our small way, have been indulging in that (cooperative education) for some time now.

For a long time we followed the traditional process of education because we were a British colony. But that traditional form of education was not what was needed in a developing country. We needed tradesmen and technicians rather than top level professionals. A tremendous development took place and changes have since been incorporated into the educational system. The engineers who now go to the University of the West Indies are required as part of their contract to work in the oil fields at practical engineering for a certain period of time. As student engineers in the field they are exposed to tradesmen who are better qualified than they at the moment, and a rapport is established between them. When they come out of the university as professional bosses we never have the amount of trouble with them that we have with imported engineers who come straight from the university and are sent to supervise. Labor remarks that the best engineers are those who have followed the cooperative process. In addition, the government conducts programs at the electricity corporation, where the students are taught in the classroom to be electrical technicians. They have practical work experience with the company, and they are paid for it all along the way. Another point which Mrs. Williams made we have also found to be true: The people who come out of technical schools are more easily employed than others.

Another aspect is important as well. Countries should involve the labor unions in cooperative education. In a situation where there is unemployment you might first run up against resentment from the unions, because the first thing a trade union looks at is any sort of program which is going to put its members out of work or reduce their earning power. But if the unions are consulted and involved, they will appreciate what is going on and cooperate. You will get a point of view injected into the program, into the training, that you won't get otherwise, and you can only get a better result out of the whole enterprise.

So I am happy to realize that in our own way we have been indulging in something which is proving more and more to be the way for young people.

DR. YACKOVLEV: Thank you very much, Mrs. Gittens. Having heard from a representative of labor and from a developing country, I'd like to ask Mr. Schöberl, who is Vice President for Personnel Training and Development of Voest-Alpine of Austria, an international firm engaged in many projects in the developing countries and therefore on the receiving end of the educational system, for his remarks.

MR. SCHÖBERL: I have come here as the representative of Voest-Alpine, which is a major Austrian manufacturing company employing about eight thousand people. It exports to most countries in the world, the eastern block as well as the western and the developing countries. I am the person in charge of providing our company and our customers with people competent to install our equipment, to put it into operation, operate, manage, and maintain it. So I am at the receiving end of the educational system.

Now that we're looking at the developing countries we work in, there are some things that I would like to point out to you. When we have installation sites in those countries we need a great number of people of various skills and educational backgrounds. We need unskilled men, skilled journeymen, foremen, engineering technicians to man the supervisory positions, and academically trained people to man the managerial and executive positions. Wherever we work we notice the same phenomenon, which is contrary to what most people think, that there are plenty of academic graduates who can fill the managerial and executive ranks. But when we come down the line to the engineering technicians who do the supervisory jobs which are the backbone of the industry that we are supposed to set up, we are short of those, particularly of those who know how a job is to be done, who can lay hands on that job and do it. Further down the ranks we come to the skilled journeyman who has learned his trade and knows how to do it in a competent way without much supervision, who can read the blueprints, repair diesel engines, work with hydraulics and pneumatics and handle his tools. Most of the developing countries are desperately short of exactly these people. Without these all the plans that those countries make fall far short of expectation because they cannot be executed, while further down the line there are usually plenty of semi-skilled and unskilled people.

We need the academically trained people in numbers, and the observation there is is that most of the academically trained people, whether they be trained at home or abroad, have been trained in a rather remote way from industry. They know very little about industry. They have never been exposed to industrial work ethics, practices, methods, and the way of doing things in industry. I can only emphasize what Mrs. Williams said this morning. She said it very eloquently. The universities are of such a high standard that they wouldn't change their ways of doing things, but they produce people who can't come to terms with the ones that actually do the job. Whenever developing countries set up universities, or expand them, they should expand them in such a way that they include exposure to industrial work practices in their curriculum, and not produce only scholarly academically trained people who have great difficulty adapting to industry's ways of doing things.

In order to make this more evident I'd like to cite a few examples. Imagine that we set up a steel plant in a country that never produced steel before. A steel operation means around-the-clock shift work, handling dangerous toxic materials, molten steel, etc. Now when we employ the people of the country, particularly in the higher ranks, they can't understand that they will have to work shifts around-the-clock, workdays, weekdays and holidays, so that the operation will never come to a standstill. They do not understand that you can't shut down a blast furnace in order to repair it; you must repair it under operating conditions. This is sometimes impossible for them to understand because they have never been exposed to industrial work practices during training.

There is one more thing I would like to point out. We talk so much about technology transfer, but technology transfer is a question of methodology. What is much more difficult is that when we pass on our technology to others we pass on parts of our value system. We expect others to accept our work ethics, and industrial work ethics are a subset of our culture which we take for granted. But it's not a matter of course to others and in many cases is not acceptable to them. Whenever we try to locate their difficulties, why we don't achieve goals, why we don't meet objectives, in most cases it's not that we have failed to transfer technology but that we have met people with different value systems who won't easily accept our way of doing things. This is what I would like to contribute to this panel.

DR. YACKOVLEV: Thank you very much, Mr. Schöberl. The next panelist we'll hear from is Professor Soelaiman, a distinguished scholar and professor in his own university in Indonesia. After a short leave of absence, which was supposed to be only two years but which now is running into six years, he is still at the Embassy in Washington. Therefore, he has not only his academic background, but also the political savvy that he brings from the capitol.

DR. SOELAIMAN: Indonesia is very much concerned with developing its human resources in a relatively short time. In natural resources Indonesia belongs to one of the richest countries in the world, and yet, in skilled human resources it belongs to one of the poorest. While workers with primary education or less are abundant in Indonesia, only 9.3% of the labor force has achieved secondary education, and only 7% of the total labor force has attained higher education. The comparatively slow formation of high level manpower in technical, scientific and managerial fields in particular has become a serious constraint on Indonesia's development activities.

In 1979 about one-third of the technical positions in the Department of Public Works had to be filled by underqualified technicians who needed an extensive period of on-the-job training. Universities find it difficult to recruit staff. The engineering faculty of the University of Indonesia has to depend upon a part-time staff for 80% of its needs. In addition, Indonesia has had to depend heavily upon foreign technical assistance for the formulation and execution of development projects.

More than 80% of Indonesians live in rural areas, in about 58,000 villages scattered over the country's 13,000 islands. Many things are lacking in these villages. There is a shortage of skilled and educated leaders and manpower, the standard of living is still very low, and the village's way of thinking is often affected by social and cultural values which hinder the process of village development. Unemployment and underemployment can be seen in the rural areas which depend principally on traditional agriculture, and many people migrate to the big cities. If the development of the country as a whole is to be a success, the development of the rural areas must proceed without delay and should not be left to the government alone. It is the responsibility of the people at all levels of society, including the institution of higher education.

The Minister of Education formulated the basic policy for the development of higher education. First, higher education must be an integral part of national and regional development efforts. Second, institutions of higher education must build bridges between the world of science and technology and the needs of the people. Third, higher education must be based on an analytical way of thinking. It should be oriented towards finding solutions to problems, and be guided by a vision of the future.

The General of Higher Education directed the implementation. One organization, the KKN, came into being in 1973. The aim of KKN, or Work Through Learning, is as follows: first, to enable the institutions of higher learning to produce graduates who will promote development because they have experienced the very complex problems faced by the community, and studied practical and interdisciplinary ways of easing these problems; second, to bring a vision of higher learning closer to the community, and to adapt higher education to the demands of development; and third, to help the government to accelerate the development process in the villages.

KKN places interdisciplinary groups of students for a period of time in areas consisting of a number of villages. The students are given training in various skills so that they can help solve the village's problems and can help build up the capabilities of local young people so that they become a force in the community efforts to develop their villages themselves.

KKN started with only three universities and ended up in 1980 with forty universities and three hundred private universities. It has become an effective and efficient tool for non-formal education, and has become complusory in the curriculum. By so doing the government is helping the villagers to develop their villages. Cooperative education has found a real target.

DR. YACKOVLEV: Thank you very much, Dr. Soelaiman. Our fourth panelist is Dr. Yousef Al-Rashid, Dean of the College of Engineering Sciences and Applied Engineering of the University of Petroleum and Minerals in Dharan, Saudi Arabia.

DR. AL-RASHID: The merits of cooperative education, I think, are established. We should look now to a structural, organizational assessment of past and special experiences of different countries.

My comments represent a point of view peculiar to Saudi Arabia in its present stage of development. The pace and the magnitude of development is such that I have no doubt that all countries, and most organizations that are involved with this conference, will come in direct contact with some phase of this development. Paramount among these phases is the development of human resources.

I come from the University of Petroleum and Minerals in Dharan, Saudi Arabia. This is a new university compared to yours. It started in 1964, and is basically a technical university similar to the American institutes of technology. We have a College of Engineering that is a twin college. It has an Applied Engineering stream and an Engineering Sciences stream, the difference being that one takes advantage of the cooperative or applied direction and the other is geared to training those that would become specialists and would go for higher degrees, either in Saudi Arabia or elsewhere.

Our cooperative program is different in that we give it as a one-shot affair. After the fourth year the student goes and spends seven months in industry. We have no difficulty in getting jobs for our students anywhere in the world where we have commercial or other types of common enterprise. In the College of Engineering, which I head, more than 70% take the stream of Applied Engineering.

I think the cooperative program is important to our students specifically because we noticed that those who haven't taken it change stream almost immediately after graduation. They go more into a managerial type of engineering work rather than actual practice and design. Also there is a tremendous cultural benefit with respect to the technical aspect of enterprise for that level of society in working the field, designing and working with machinery. We have a background that did not place high prestige on that type of work.

Some of our problems are that some of the transnational firms that take our students do it as a public relations gesture, and this compromises the benefit that the student might accrue from that experience. They pay him well, they give him a good office, but they are not very demanding of him and don't give direct supervision. This is due to many factors. There is a tremendous competition for our graduates because of the magnitude of projects that are taking place. All graduates are absorbed immediately by the market, whether public or private. Therefore, the companies are not very certain that the student will work with them after graduation.

Another problem we have, especially with those students that we send abroad, is that in addition to adjusting to a new area of professional training they have to adjust to certain cultural problems, and sometimes the time that is given for this is very short. All in all, however, I believe our programs are very, very satisfactory.

DR. YACKOVLEV: Thank you very much, Dr. Al-Rashid. The four members of the panel have been very brief. They have given us ample time for discussion, and I want to thank them all for this. We all participated in a real working and dynamic session, but before throwing the floor open to comments from the audience I would like to use the privilege of the chair to make a couple of comments with regard to the presentations made prior to this morning by Dr. Davidson Nicol and Mrs. Shirley Williams.

Dr. Nicol mentioned that there was a need for a sharpening of a definition of cooperative education. He's very right, because he himself mentioned several instances which to my mind are definitely not cooperative education, as did Mrs. Shirley Williams. The reason I bring out this point is that when something is being introduced, when it's still not quite widespread, there is a lot of confusion. At this stage we begin to mix cooperative education, continuing education, graduate education, and we only create chaos for the developing countries. It is confused enough in the developed ones already.

Secondly, Mr. Schöberl mentioned that in the majority of the developing countries there is really no lack of professionals. What is really lacking is the technical trained technician or skilled laborer. This has to be qualified lest it be interpreted that there is no need for engineers or high level professionals. There is a great deal of need, and this is a word of caution in that sense.

Furthermore, perhaps there is nothing wrong with changing the value system, because one of the reasons that there are no technicians is precisely because of the value system existing in many of the developing countries. Young people do not want to go into technical areas, skilled labor, higher technology, because there is a certain social stigma attached. We should instill in our people that there is nothing wrong with working technically.

SPEAKER FROM SRI LANKA: If you take the examples of Japan, Korea, Taiwan, Hong Kong, and Singapore, the transfer of technology has immediately brought a change of value systems to the work ethic. And probably they are operating very well. I think that might mean something to the Western world nowadays. So inviting a change of value system is a very important aspect of the program.

UNIDENTIFIED QUESTIONER: What do you see to be the role of international financing mechanisms and the role of the government in facilitating the development of international exchange programs in cooperative education, knowing that the immigration laws may present some major difficulties in achieving that exchange?

DR. SOELAIMAN: In Indonesia the government, including the local government, financed the KKN project through a loan from the World Bank.

MR. SCHÖBERL: It seems to me of top importance to produce skilled labor in the first place. So whenever you have money to invest, it is safe to invest it wherever you produce skilled labor. The engineering technicians who can assume responsibility for the operation of those industries that you buy into your country will protect your investment. Unless you have the people who can operate and maintain that, most of your investment is lost.

UNIDENTIFIED QUESTIONER: What suggestions would the speaker from Trinidad have for including organized labor as part of this discussion?

MRS. GITTENS: Labor was represented on the National Education Advisory Board, so that it gave them a perspective on what the working man and woman thought about what was being planned educationally. Also, a university will plan to put on a massive cooperative education program and will invite the

National Labor Center to send a representative to the discussion. You will be surprised at the sort of cooperation and assistance you get, and you won't get that perspective from anybody else, I promise you.

UNIDENTIFIED QUESTIONER: I would like some panelists to speak about the unemployment in the developing countries in reference to the question of high technology and appropriate technology, capital intensive versus labor intensive, and how cooperative education can fit in with this question.

DR. SOELAIMAN: In Indonesia, for example, we needed hydropower plants to irrigate the rice fields and generate electricity, so we built a turbine using just truck wheels. This is appropriate technology, using the knowledge of higher technology but applying what we have. This is what we teach to the villagers. Two or three villages already have electricity.

MRS. GITTENS: This morning Mrs. Williams, I think, made a point about how the whole world society has become capital intensive and wastes human resources. Because Trinidad wanted to attract the transnational companies we gave them all sorts of credits and free benefits. They tried to pay less wages than they would have paid in the United States. They didn't realize that they were coming into a sophisticated trade union environment, and when they ran into it, they left. Our analyses proved that a lot of these industries were capital intensive and were doing nothing to ease the unemployment situation.

A large percentage of youth in developing countries never reach university level. You have to employ this cooperative education system at high school level, or even at the basic primary school level to eliminate youth unemployment one hundred percent, because these youths will be ready for employment when they have finished these levels of schooling.

Furthermore, one reason that people are now looking at the second level jobs is that they have a social status of their own now. The trade unions say the technician has got to be paid. That's the sort of thing you've got to concentrate on for these youths.

UNIDENTIFIED SPEAKER: I come from the Inter-American Development Bank in Brazil. This morning I heard a speech in which we educators are blaming education for not procuring employment for all our educated people. I don't think this is very fair because you still have the social structure. Formal education does not solve the problem; not all our graduates find jobs. We run into vocational training, but those already trained cannot find a job. We run into continuous education; the same thing happens. Now we are talking about cooperative education. In the future we will be talking about new forms of education. But will they solve the unemployment problem? Do we need all of them? I would say we do need them, because we have different types of people who are going into the system. But that doesn't mean that we as educators are going to be responsible for the employment system. Cooperative education is one more step within other steps, but education alone cannot solve all the society's problems.

DR. YACKOVLEV: Thank you very much. Ladies and gentlemen, you have been a wonderful audience. Thank you very much to all our panelists.

DEVELOPED COUNTRIES' RESPONSE
DISCUSSION PANEL

George Papadopoulos, Chairman
Deputy Director of Education, OECD, France

Joseph Shenker
President, LaGuardia Community College, United States

Björn Grünewald
Deputy Director, Educational and Training Policy
Swedish Employers' Confederation

DR. PAPADOPOULOS: This conference is about the development of human resources. But this concern is both new and different from what it was in the 1960's and early 1970's when we were living in a growth situation. It also arises in a different context, which has been admirably summed up by Shirley Williams: recession, the climate of constraint in terms of public expenditures and demographic trends, and the attitudes that the public is developing toward public problems. Then there are the problems which arise from the new world economic order and the need for the developed countries to develop their human resource potential in a situation of shortages and the expensive raw materials. Pervading this is persisting unemployment which is not a temporary feature and which hits the young most hard.

Most of the western countries were taken by surprise by these developments, particularly with regard to youth unemployment, and in many cases they have panicked. But youth unemployment seems to have been absorbed without major disturbance. The youth have no spokesman, for one thing, and the attitudes of both employers and trade unions are such that they tend to protect the rights of people who are already in work, so it has not blown up into a major political problem. Also, in most of the European countries the government has focused on measures to facilitate the transition from school to work. The point to be noted here, however, is that such measures have been designed on an ad hoc basis, they cannot alleviate the overall global unemployment problem because that is a function of economic activity, and they help to change the competitive order of various groups of youth in their search for job opportunities. Furthermore, most of the measures have been designed to cater to the needs of the disadvantaged.

My second point focuses on the differences which exist between the United States and Canada on one hand and the European countries on the other, and then within the European countries themselves in their approaches to these problems. The first big difference between North America and Europe is the rate of participation in education by various age groups. In the States, Canada and Japan almost the whole age group up to 18 or 19 is fully enrolled in some kind of education. In the European countries the proportion of enrollment varies from 40 to 60-65%. That is why in Europe, more than anywhere else, the emphasis has been on the transition from school to work.

The second big difference is that in European countries education is a public concern, whereas in countries with mass education systems like the U.S., Canada and Japan, there is more of a market approach to educational provision. In Europe it is still a major problem to talk of private initiatives in education or to allow industry to play a role in determining curricula or teaching methods. Related to this is the concept of professional mobility. In Europe, and much more so in Japan, professional mobility is not necessarily regarded as a desirable thing. A life commitment situation still prevails, whereas in the U.S. people change jobs over their lifetime.

Finally, the attitudes of those who participate in education are different. In Europe, traditional cultural academic values prevail. Education of a traditional kind is the main avenue for social upgrading while vocational education and training is considered second rate, so that a strong correlation exists between social and family backgrounds and choice of educational career, which is then reflected in a professional career. It is only recently that a change has been observed.

Within European countries themselves there are differences, namely between those systems which encourage heavy enrollment in the normal school system after secondary education as the main avenue to the labor market, and those countries--Austria, Germany and Switzerland--which encourage very heavy enrollment in apprenticeship schemes. These reflect different political philosophies. Austria, Germany and Switzerland accept a situation in which the child, son or daughter, will have the same profession as his father. In these countries the professions tend to be perpetuated within families.

My third and final point deals with the consequences of unemployment, which is having a significant impact on people's attitudes toward education. Individuals are preferring employability oriented programs rather than the traditional academically oriented ones, and for the first time more affluent people are enrolling in the technical and vocational courses which had been reserved for the poor. This affects the pecking order of educational institutions themselves. Institutions are in demand now not for their noble status, but for the job opportunities that exist for those who enroll in them. But what will happen now to the social sciences and the humanities? There is evidence in the United States to show that people have to be sent back to school to get a broader cultural education. They must be able to communicate, write and formulate, even in positions of serious managerial responsibility within technological sectors.

As a result of this there is a trend to revalorise, or give value back to vocational education and training and to bring it into closer relationship to general education. This is probably the biggest positive effect of unemployment. Most students over 18 are demanding combinations of work and study. They do not want to find themselves either unemployed or in positions inferior to their own aspirations and educational qualifications. This brings cooperative education very close to the concept which we developed at O.E.C.D. of recurrent education, where you take educational opportunities as you think fit throughout your life rather than in the first 25 years of it. But there is a danger here that cooperative education, just like recurrent education, will become a slogan into which everything is thrown that is not pure education within the school system and that it will be adopted because it is politically viable, while in practice it won't mean a thing.

MR. GRUNËWALD: My main point is that the theoretical schools have become so isolated from the rest of society that their ability to prepare students for active participation in the adult world has become seriously hampered. This is more apparent in the North American countries. but it happens even in Europe, and since I come from Sweden, where our practices have perhaps developed in slightly different ways than in other European countries, I will share the Swedish experience with you.

We also have youth unemployment, not as much as some countries but much more than for any other group in our country. At the same time a very serious lack of manpower exists for Swedish industry. This is due to attitudes in the population, among young people and in the schools.

We have a comprehensive schooling system in which everybody spends nine years in the compulsory primary system and then is supposed to go on to secondary level schooling. However, 20-25% do not go on, and this group encounters all the difficulty. Their education is poor, they have no preparation for any kind of vocational activity and they often have become so confused and distressed by their primary schooling that they can't really make any use of it. They become drop-outs not only from the school situation but from society. But then, the isolation of the school itself from the rest of society has increased.

As long as the education and development of the young is done within the society itself, what goes on has meaning for those who are participating in it. They can see why they have to learn things and how these things are used in society. They can watch and gradually adapt to what the adult world is doing. But there are limits to the possibilities of a society relying entirely upon this type of self-instruction. When society develops, so does the need for more advanced and organized learning systems, and here lies the trouble. The very act of organizing a learning system starts the process of isolation between that system and the society for which it operates. This is a problem that many of the industrialized and developed countries have experienced.

In Sweden it has gone so far that the vocational preparation necessary for an active adult participation has become uninteresting and unchallenging to young people. This is where the concept of cooperation comes in. If you take the training and educating of young people directly within society as one thesis of how you can do this, and developing the young people in a separate learning system as the antithesis, then the obvious synthesis must be a cooperation between these two systems.

The world of work cannot cope with the development and education of the young by itself. We need a broader base both in terms of general and professional training for those who are to participate in the working life of our societies so that when things change in a dynamic society these persons can partake in this change without too much trouble either by training for new jobs in the short run, returning to the learning community to renew or upgrade their professional skills or totally exchanging them for new ones. This can only be done if these two systems cooperate, not only on the university level but from primary education all the way up.

I will end with this note: Because of the isolation mentioned above, schools have been asked to perform something that they are not given the means nor the resources to prepare themselves for by our societies. We must give schools a better understanding and a higher priority in our societies and watch closely the way they operate, because to many young people the whole educational process has become so abstract that they cannot see the meaning of it. They lose interest and their motivation ends, and without motivation you cannot do very much. Therefore it is necessary that the world of work and the schools be more connected, have more open access to each other, so that both teachers and pupils on all levels can move freely between the systems. In this way the educational system can see for what it prepares and all its participants can really understand why they prepare.

DR. PAPADOPOULOS: Thank you, Mr. Grunewald. I think that when we come to the discussion we should get Mr. Grunewald, in his capacity as representative of the BIAC (Business and Industrial Advisory Committee to the OECD, Organization for Economic Cooperation and Development), to be a little more explicit about what the industrial world would expect of the school system itself in terms of how the breaking away from its isolation could be achieved.

MR. SHENKER: I think that Mrs. Williams' analysis that the educational system is bearing the blame and brunt for an unemployment structure which is developing through the developed world is correct. It is a social problem developing from many different sources and for many different reasons, but the criticism is directed at one facet of society and leaves the educators a bit bewildered as to how to confront it. For them it poses the problem, "What can we alone do about it?"

One of the problems we are confronting is that throughout our social structure we tend to compartmentalize various activities, even within the educational world itself. The people who work with the youngest children do not talk with those who work with teenagers, who in turn do not talk with those who work with college level persons. Each falls into their own separate compartment.

The same is true with the industrial and the educational world. There is no attempt for either party to gain maximum benefit from an interchange of knowledge, abilities and experiences which can then benefit society. It is important to remember that both of these structures are working with the same individuals as they grow older, move through an educational system and then into a job situation. The same person appears in elementary school, high school, college and then the corporation, and yet these groups don't talk with each other. This is critical when we speak about cooperative education.

The educational system does not have a monopoly on teaching and training ability. Clearly in the area of technology the corporations have the gadgetry in far greater availability than the educational system does. Educators can learn a tremendous amount by seeking out the experience of the industrial community, yet that interchange has not taken place. Furthermore, both groups are responsible for the development of human capital, which provides a return to the individual and to the economy. Structures and linkages must be built, and some experiments are now being developed, but I think these experiments are too little and too late. Basically, a challenge has been put forth to us, the educators and the industrial communities, and we have failed. These efforts should have been started years ago. The problem is becoming acute. Perhaps as a result of our discussion here this morning some of the experiments can be moved along at a faster rate.

DR. PAPADOPOULOS: Part of the European problem has been the suspicion that industry would interfere with the educational system. But at the same time the best students, particularly in higher education, seem to be adverse to industrial careers. You provide for scientific courses but they are not taken up. It is a question of attitudes. If we are all agreed on the need to facilitate closer links between the two systems and to allow for opportunities for part-time work and part-time study in a combined approach to the development of individuals, where does the responsibility lie so that the long-term objectives of our societies are not sacrificed to short-term conjunctural requirements to which the economic cycle may give rise? How does responsibility get organized? What are the roles? What are the mechanisms by which one system does not become subservient to the instrumentalist objectives of the other system?

I think it would be extremely useful at this point to hear the views of Dr. Friedrich Edding of the Max Planck Institute in Germany, who has been the guru, if I may so call him, of the economics of education for almost a generation. (Dr. Edding is a prominent education researcher in Europe.)

DR. EDDING: The question of responsibility is highly important. In Europe, where the traditional educational system is financed by, controlled by, and responsible to the public, another system is gaining importance as a competitor. In West Germany the cost of the traditional system is now about $60 billion, and the cost of the other system is about $40 million. As a rule these two systems proceed separately. There is no order, no mechanism or place for making a deal between them. This they do regionally. Links do exist, but as I see it there is a call for a new deal between the systems.

I asked a prominent employer in my country why he was spending 5% of the total money spent of wages for education inside the firm. Was it for more productivity? better preparation for work? adaptation to new methods? He said, "No. This would be a grave error. It is not possible for young people at the age of 16 to get a real job in highly mechanized and automated production, so we introduce them to our way of life. For the first two years we prepare them in classrooms, laboratories and workshops. Then maybe they will be good enough in the third year to have their first experience with the real production machinery in the firm. We continue to give them opportunities to learn other specializations so that they get the broadness that is needed and which they can use as a free agent in the labor market. They can continue with adult education in the firm and can study everything from philosophy to new mathematics. The firm pays for all this."

This employer was quite conscious of the fact that he was competing with the public system in doing what he did as a responsible head of the firm. He said, "Quality is such a wide field. Inside this firm I can do quite a bit to order the world as I feel it should be ordered. Outside it I can do very little."

Now some politicians may not like this philosophy. That is why we must have a deal, because the question arises as to who should finance this program of caring about the youngsters who are unemployed, giving them some kind of education and some acquaintance with practical work, and taking on tasks otherwise done by educational institutions. And once you have settled this question you have to ask whether those who finance it should have complete control over it.

Our society has not proved that one learns certain things better on the job than in the classroom, but I think it is a good hypothesis. Yet nothing is being done, as far as I know, to finance this experimental approach, whereas large funds exist for research.

My final question is, "How can a world organization, in which nationally and internationally responsible representatives of the two systems work out what their national cost will be and what kind of controlled competence will accompany the payment of this new cost, prepare the first steps for a new deal?"

MRS. WILLIAMS: It is sad to me that in this audience where there ought to be half employers and half educators, there are overwhelmingly educators and not employers. Employers tend to look at the schools and say, "You aren't giving us the product we want." But this is partly, I fear, because one of the products they want is people who don't ask difficult questions and raise difficult issues. There has not been the interchange between the teaching profession and the industrialists or trade unionists that I would like to see in Britain, or for that matter in the United States.

DR. PAPADOPOULOS: Behind this problem lies the question, "What are the circumstances under which the coming together and the dialogue can take place?" In countries with strong traditional public control and public intervention, the government is responsible for creating the necessary conditions by which the dialogue can take place. Some countries are beginning to do that. In other countries like the United States the professional groups who lobby and create political pressures often take the lead in moving in these directions.

MR. GRUNEWALD: I think that one very grave problem here is that we have fractionalized our societies. Very few have an overall view of what is going on. Instead, we all have vested interests.

SPEAKER FROM AUDIENCE: One question raised was whether students learn more in a classroom setting or an on-the-job setting. I think they learn equally well in both settings although they learn different skills and different techniques. It is not a matter of choosing one over the other but of using both in a complementary fashion to educate students and potential workers. The conflict posed earlier does not really exist. Furthermore, I don't think that cooperative education is an answer to unemployment. It might be an answer to a correct job training structure if the jobs exist, but the educational vehicle alone cannot create jobs.

MRS. WILLIAMS: One thing that is quite clear is that we are parking some children in our schools, particularly in the United States, who are unhappy, who feel they are not being treated as adults, and who are not only not learning but are developing anti-learning attitudes which may last them all their lives. Therefore there is, in fact, a great deal to be said for the work-centered form of education and training for "potential high school drop-outs." I was very struck by the fact that the Youth Employment Demonstration Project Act, which was passed in the United States in 1977 and which guaranteed part-time and summer jobs for youngsters providing they were willing to return to school, only led in the first two years to 6% of high school drop-outs going back to school. The alienated youth that the high schools were trying to attract back, and for whom the federal government had given them money, would not come back even when they were guaranteed a job, and they were almost certainly out of work at the time.

I am very struck too by the fact that West Germany consistently attracts more skill-intensive investment than does the United States, France or Britain. One reason for this is quite straightforward. West Germany has a much better trained work force than the rest of us do and investments are not held up by the absence of the key skill factor.

2ND SPEAKER FROM AUDIENCE: I am on one of the United Kingdom's Industrial Training Boards and I am also an old political colleague of Shirley, and I am eager to know her view on the values of the Industrial Training Board in the development of cooperative education and how she views the current government's assault on the Manpower Services Commission and the Industrial Training Board's activities.

MRS. WILLIAMS: I think the decision not to continue to finance the Industrial Training Board is a great mistake. The Industrial Training Boards in Britain have been trying to devise more modern forms of training, particularly forms of modular training. By modular I mean compatible rather than the incompatible bricks of training and education where, if you do not complete one course, you cannot pick it up again at a later stage in your life. With modular training you train for a year and then five years later you may come back and add a second year to it, constantly building on your qualifications.

Another point I would like to make is this. In Europe, even in Germany, we are locked too much to the concept that the apprenticeship starts at 16 and ends at 19 or 20. We are not sufficiently developing the idea of the much later training of adult workers. In the United States the fault is exactly the opposite. You have virtually no effective system for transition from the high school at 16, 17 or 18 through to entering work. Those who do not go on to higher education in the United States very rapidly become the wretched of society, with almost no chance of climbing back out of what is often the unofficial economy--the economy of drugs, of betting, of dubious ways of making a living--because you have not dealt with the essential problem of how you train disadvantaged youngsters in your inner cities. You just leave them to rot. You have got to do something about your disadvantaged youngsters and we have got to do something about our disadvantaged adults if any of us are going to speak with self-respect to each other.

DR. PAPADOPOULOS: If I could have one final word, we have noted that in the European system all the 18-year-olds and a large proportion of the 19-year-olds are still enrolled in secondary education. In the United States all the 19-year-olds and a very large proportion of the 18-year-olds are registered in higher education. In Europe greater emphasis is being given to solving the problems of the young before they get to legal maturity, whereas in the States the problems are deferred to the age beyond that. Europe will not follow the American pattern of mass higher education; we'll try to solve in the primary and early secondary schools a number of the problems that the Americans solve in remedial programs at the community college level.

I think this has been a very interesting and stimulating raising of problems. I hope that in your detailed discussions you will bear in mind the remark that I made earlier that for goodness sake don't put into the cooperative education basket everything, because you'll tend to convert it then into a wastepaper basket.

THE VALUES OF COOPERATIVE EDUCATION FROM A PEDAGOGICAL PERSPECTIVE

Ralph W. Tyler
Director Emeritus, Center for Advanced Study in the Behavioral Sciences

THE WILSON-LYONS STUDY

Those of us who have been closely associated with cooperative education have observed many examples of the educational values of this form of education. The comprehensive investigation of Wilson and Lyons published twenty years ago provided more objective and systematic evidence. Among those values identified in their research were the following:

"1. By coordinating work experience with the campus educational program, theory and practice are more closely related and students find greater meaning in their studies.

"2. This coordination of work and study increases motivation. As students see connections between the jobs they hold and the things they are learning on campus, greater interest in academic work develops.

"3. For many students, work experience contributes to a greater sense of responsibility for their own efforts, greater dependence upon their own judgements, and a corresponding development of maturity.

"4. Because the work experience involve the students in relations with co-workers who come form a variety of backrounds, and because success in these jobs require constructive relationships with colleagues, most students in cooperative education develop greater understanding of other people and greater skills in human relations. Particularly important in this connection is the value obtained from the contacts made with adults in a variety of situations, thus helping to break down the segregation of college students into a wholly adolescent community.

"5. Cooperative education helps markedly to orient college students to the world of work. Most college students are greatly concerned about their future life work. They want to know more about the range of occupations available to them and the potentials and limitations of these fields. They want to know about the qualifications demanded and their own fitness for them. Cooperative education furnishes students with opportunities for exploring their own abilities in connection with real jobs and they find a direct meaning of gaining vocational information and vocational guidance not only in the occupations in which they are employed but in a number of related fields as well. They have a chance to test their own aptitudes more fully than is normally possible on the campus. Furthermore, in many programs of cooperative education, students are enabled to understand and appreciate more fully the meaning of work to the individual and the function of occupation in providing the wide range of goods and services characteristic of our economy.

"6. From the standpoint of the nation with its increasing need for well-educated people in science, as well as from the standpoint of individual self-realization, cooperative education has an important value in making higher education possible and attractive to many young people who would otherwise go to college. The earnings of the students while on the job have enabled many to attend college who could not finance their college without it. The assurance of having a job while in college makes cooperative education seem practical and attainable to many youths and their families, who have had no previous connections with colleges and are skeptical of the values of "book-learning" and of their own potential for college work.

"7. As work programs are planned and developed, and as the students rotate from college to work and back to college again, the faculty is better able to keep in touch with business, industry, and some of the professions. For many of the colleges, information gained through these contacts is used in planning the curriculum and in teaching thus contributing greater educational vitality. (1)

THE NEEDS OF YOUTH TODAY

Although this comprehensive study was completed two decades ago, the need for cooperative work experiences today is greater than ever. Judge Mary Conway Kohler, Chariman of the National Commission on Resources for Youth, states in the February, 1981 issue of the Phi Delta Kappan:

> "Maturity is measured by one's ability to accept and follow through on responsibilities for one's self, one's family, one's work, and one's community. To make that transition to adulthood, young people urgently need opportunities to be responsible, caring, participating members of our society. In adolescence, young people begin to define self-worth in terms of what they are able to do and the impact they have on their surroundings. Yet this opportunity to discover one's self through action and contribution is missing in our society. We ask young people to prepare for a nebulous future without allowing them to participate here and now. By denying young people an immediate role in our society, we prolong their dependence, undermine their self-esteem, and cripple their capacity to care. No wonder young people feel anxious, alienated and unwanted.
>
> "The problem of empty adolescence is relatively recent. In the past, no one expected young people to go through a lengthy adolescence. Agricultural and early industrial society required immense amounts of labor and young people were absorbed early into the workforce. Families were large and simple survival of the household depended upon contributions from everyone, including young children. As the children grew, they gradually assumed more and more responsibility until almost without noticing it, they became adults with jobs and families of their own...
>
> "Today,. . . society offers little for (youth) to do...even though this is the time when they most urgently need to examine and explore the alternatives that will be available to them as adults." (2)

As we review the contemporary scene portrayed by Judge Kohler, we see clearly that youth of today need real opportunity to participate responsibly in the important institutions of modern society. In this respect, cooperative education makes a substantial contribution to the development of youth and to the survival and strengthening of our society by furnishing opportunities for young people to participate responsibly in the world of work while being encouraged on the campus to gain greater understanding of the work experiences and to acquire those academic competencies that enable them to guide their performance intelligently.

(1) James W. Wilson and Edward H. Lyons, Work-Study College Programs, Harper and Brothers, New York, 1961, pp.6-7.

(2) Mary Conway Kohler, "Developing Responsible Youth Through Youth Participation", Phi Delta Kappan, February, 1981, p.426.

A PEDOGOGICAL APPROACH

The Wilson-Lyons study and the Mary Kohler report are both summaries. One summarizes the identified values of cooperative education and the other summarizes the urgent needs of youth for opportunities to participate responsibly in society. As a student of learning and teaching, I have been asked to analyze cooperative education in pedagogical terms, that is, to identify the constructive elements of learning and teaching that can be employed in work-study programs of this sort.

In analyzing student learning systems in a college or university, it is helpful to keep in mind a general picture of the process of conscious, complex human learning since it differs from habit formation and other kinds of learning that do not involve self-direction by the learner.

In conscious, complex human learning the student seeks to acquire new patterns of behavior, that is, new ways of thinking, feeling or acting. His or her perception of the new behavior guides the student as he or she undertakes the tasks that are set up to enable him or her to carry on the behavior and to practice it. If the student is successful in these learning tasks and gains satisfaction from his or her performance, the student continues the practice until the behavior becomes part of his or her repertoire to be used in appropriate situations. If the student does not succeed in the initial attempts, he or she still may learn if he or she perceives what was wrong and is encouraged to try again or to try in another way.

This somewhat simplified description of the learning process will serve in identifying critical steps that for some of the common inadequacies in the student learning systems and help to explain some of the ineffectiveness and ineffeciency of much college instruction. Briefly, they are:

1. Some students do not seek to acquire the new behavior.
2. In many cases, the learning tasks are presented without a clear indication of what the student is to learn; in fact, frequently the learning tasks are not relevant to the desired behavior.
3. Many students do not perceive the learning tasks within their competence to carry out and do not seriously attempt them.
4. Some students do not get satisfaction from success in learning tasks.
5. Some students get inadequate feedback to guide their efforts when they fail in their early attempts.
6. In many cases, inadequate practice opportunities are provided for the learner to use the new behavior in the varied situations where it is appropriate.

Cooperative education, as documented by the Wilson-Lyons investigation markedly helps to overcome these inadequacies of much college instruction. For example, students who do not seek to acquire the new behavior develop motivation when they perceive the relevance of what they are expected to learn on the campus to the activities they carry on in their off campus work.

MOTIVATION

Lack of motivation to learn what instructors try to teach is not commonly a problem in professional schools in courses that are perceived by students as teaching things of importance in professional activities. Almost all students in professional schools want to be successful in their careers and seek to learn what they believe to be important for the profession. However, in many programs, the student is not clear about what behaviors he needs to acquire to be a competent professional. For example, in engineering the first year student often spends most of his time in courses taught by mathematicians and scientists.

He sees something of what they do, but he observes few engineers closely enough to see what they do and particularly to distinguish what an engineer does with mathematics and physics in contrast to what a mathematician or physicist does. Cooperative education enables the student to discover by work experience the ways in which mathematics and physics are used and what particulars in these subjects illuminate his or her work. Engineering is cited only as an example. Work experience in other occupations can serve in similar fashion to enhance motivation for relevant academic learning.

CLARITY OF GOAL

In attempting to carry on the behavior to be learned, the student needs to have a fairly clear conception of what he or she is trying to learn. In the case in which what is to be learned can be directly observed--as in learning to swim, to dance, to play golf, the student can gain at least a rough notion of what he is to learn by watching persons who are swimming, dancing, or playing golf, so that he can emulate those who seem to be carrying on successfully. But when the learning goal is an intellectual or emotional behavior such as a way of thinking, or a way of responding to a work of art, the behavior and its essential characteristics cannot be directly observed. In these cases, students commonly look for clues from the instructor or other students regarding what they are to learn. Unfortunately, too often the instructor's lectures tells what has been found out in this subject and not what intellectual or emotional processes the student needs to learn. The student, in turn, often tries to memorize the content of the lectures or the textbooks rather than to carry on the desired intellectual and emotional behavior. Even in programs preparing professionals, students are frequently not clear about what they are trying to learn. This is particularly a problem when the professional role is one of identifying problems and solving them rather than simply following an established set of procedures. Students often think they have come to college to get answers that they will use as professionals, rather than realizing that they are to learn how to identify problems and then work out their own answers.

The work experience part of cooperative education helps the student to perceive directly some of the behaviors he needs to learn, and those instructors who keep in touch with the occupational roles of students can help to clarify the learning goals. In my experience, once the instructor recognizes the problem, he is able to clarify many of the learning goals by explanation, demonstration, and working along with students in order to carry on the desired behavior and explain what he or she is doing.

CONFIDENCE

Some students do not attempt the learning activities because they feel they will not be successful. If the student does not believe that he or she can do the learning task he or she is not likely to attempt it because the student does not want to be perceived as a failure by classmates. The proportion of students who lack the confidence required to put forth serious efforts to learn is larger in courses that are perceived by students as esoteric or involve activities very different from those they have carried on previously; for example, courses in advanced mathematics, theoretical sciences, and philosophy. Cooperative education, by relating the work activities in which the student is engaged to the campus learning activities, engenders confidence in the student that he or she can do academic tasks that are relevant to work he or she is doing satisfactorily.

REWARDS

As the student successfully carries on the behavior he or she is seeking to learn, the stimulation to continue the practice comes from the rewards; that is the satisfaction he or she obtains from successful performance. There are many possible rewards that are satisfying,but the nature of the reward system should be consistent with the role of a self-directed, responsible student. This means that the students would obtain major satisfaction in learning from the pleasure he or she obtains from having acquired and used new understanding, new interests, new attitudes, new skills and appreciations, rather than depending largely on the rewards that are extraneous to the learning itself. If the major satisfaction in learning comes from the instructor's approval or the grades received the student is left without this reward system that has guided him in college when he has graduated and should be self-directive. This emphasis on intrinsic rewards is not intended to deprecate supplementary rewards furnished by the instructor, by peers whom the student respects, and by his or her anticipation of pay-offs from the learning perceived as a necessary step to another goal he or she cherishes.

Because most students care deeply about succeeding in their work, cooperative education's work experience furnishes an added context in which success in campus learning provides rewards. Most students obtain satisfaction from activities that are perceived as helping them in their work, by giving them increased understanding or skill or appreciation of what they are doing.

FEEDBACK

Some students have difficulty with the learning task and do not carry on the desired behavior satisfactorily. Obviously, to reward their efforts would result in their learning the wrong things. They need to be informed that their behavior is not satisfactory, and they should get some information about what the difficulty seemed to be. This is commonly called "feedback". Then, they need to be encouraged to try again, either on the same learning task or another one that seems more appropriate for their present stage of learning. Feedback is not a usual procedure in college and university courses. Tests and examinations are usually designed to stimulate the student to study or to seperate students on a grading scale rather than to furnish the learner with an indication of the things he or she is learning successfully, and those where their efforts have not been fruitful. Even less frequently are feedback systems used to help guide the student's subsequent learning activities when his or her behavior has not been adaquate.

Cooperative education does not automatically furnish feedback to students but the procedure of some work supervisors and coordinators of reviewing work experiences and academic learning activities with individual students will provide information to the student regarding his successes and difficulties that help to guide his further efforts in learning both on the job and in the classroom. Greater attention to individual student feedback by instructors, supervisors and coordinators could improve student learning systems.

OPPORTUNITIES FOR PRACTICE

The importance of practicing new behavior in order to learn it has been recognized for millennia. "Practice makes perfect" is the proverbial expression for it. However, this principle is inadequately followed in many college and university courses. The use of the traditional lectures and textbooks often minimizes problem-solving behavior and overemphasizes memorization and the practice of specific skills. Even in programs preparing professionals, it is rare for faculties as a whole to analyze the major components of professional roles and provide realistically for the student to practice in context these components until he or she has mastered them and can use them in the work of the profession.

It is not enough to furnish some opportunities for practicing the behavior to be learned for it is also essential for the student to have time for the necessary practice. Too often, students spend most of their time in class, sitting passively while the instructor performs, rather than actively engaging in the thinking, feeling, and acting that they are expected to learn. Assignments for out-of-class activity, also usually involve mostly passive reading rather than active efforts to use what is discussed in the class and in the readings.

Another important criteria for opportunities to practice is that they should be sequential. Sequential practice means that each subsequent practice goes more broadly or more deeply than the previous one. Sheer repetition is quickly boring to the learner and has little or no further effect. Only as each new practice requires the student to given attention to it because of the new elements he or she perceives in the new situation does it serve adequately as a basis for effective learning. This factor is important for the student in gaining understanding because it means that concepts and principles are brought in again and again, but each time in new and more complex illustrations so that the student continually has to think through the way in which these concepts and principles help to explain or analyze the situation. In developing a skill, one must see to it that each new practice of the skill provides opportunities for greater variety or complexity in its use. Sequence is also important in the development of appreciation for it means thay each new work of art should be demanding something more of perception and be providing opportunity for greater variety and depth of emotional response. The importance of opportunities for sequential practice could also be illustrated with the learning of new attitudes, interests, and problem-solving; in fact, of all kinds of complex behavior.

Cooperative education expands tremendously the opportunities for practice provided students. The work tasks and the other off-campus experiences furnish a real context for the practice of problem-solving; efforts at understanding natural and human phenomena, or exploring and experiencing new attitudes, and interests and the development of relevant emotional responses. Because of the substantial time spent in off-campus activities, they afford the time to practice often lacking on the campus. As instructors, coordinators, and supervisors develop work programs that avoid where possible, repetitive activities that soon lose the student's interest, opportunities for sequential practice are greatly increased.

An important consideration in providing opportunities for practicing what is being learned is to facilitate transfer. Obviously, educational institutions are established to help students learn things that they will use in the various situations they will encounter in and out of college. Unfortunately, some students learn things in college but rarely, if ever, use them outside. To overcome this lack of transfer, many students need opportunities to practice off the campus, while they are learning. Cooperative education with its alternation of work off the campus with academic learning is ideally suited to furnish conditions for transfer of learning.

This brief review and analysis of the learning system of college students is intended to illustrate the pedagogical implications of cooperative education both to explain some of the educational values of cooperative education and to provide a rationale for instructors, coordinators and supervisors to use in seeking to increase the educational effectiveness and efficiency of their programs.

KEYNOTE SPEECH

Robert Willis
Chairman and President
Connecticut Natural Gas Corporation, United States

We meet at a time when most every nation in the world faces a variety of serious economic problems. The difficulties confronting the developing countries have been written about, discussed at this meeting and are well known to you. The economic problems of the developed countries are equally familiar to you. We, who represent the key sectors of our societies, must accept the responsibility of developing effective solutions to these problems. We face an enormous task and so much--so very much--is expected of us.

Yet, in attacking these problems, we have the opportunity of changing the way we do things. Reform and change are difficult under any set of conditions. However, in my view, it is the nature of human beings to be more open and willing to change when confronted by serious problems and when the alternative of sustaining the status quo can prove to be disastrous.

One thing seems clear to me and that is to overcome our difficulties we must collaborate. It makes little sense for us to spend our time castigating each other and seeking to lay blame at each other's door step. If, however, we are to collaborate we need first to come to understand each other and our view of the problems that confront us. This lack of understanding may indeed be our most fundamental difficulty. We come with different views of the world. I do not believe that it is particularly useful for us to dwell on our differences. Therefore, I do not want to get into the questions of planned vs. non-planned economies or profit generating vs. non-profit generating enterprises. Rather, I shall use the term business enterprise as referring to the sector within a society that is responsible for the production and distribution of its goods and services. And with this in mind, I wish to bring to these discussions a business perspective.

It is true that we who come from the areas of business, education, trade unions and government most likely have different backgrounds. But I do believe that our goals are similar in at least the human resource area. I believe that we here all wish to develop a stable society based on policies which allow every person in our society to live a meaningful and productive life. Each person would be in the economic mainstream and have the knowledge and skills concomitant with their abilities to enable them to make their maximum contribution to the economic well being. By achieving this goal, we would enable people to break the chains of poverty currently existing throughout the world. By providing employment opportunity and subsequent employment mobility we contribute to increased self-reliance and self-respect, increase the general level of satisfaction and would certainly improve the quality of life.

Of course I am describing the ideal, but is there anyone here who does not subscribe to these goals? It would be foolish to assume that these goals can be achieved in either a simple way or overnight. However, we really must take significant steps in their direction and I would hope that this conference will be an important contribution.

Business enterprises cannot and do not operate in a vacuum. It performs two critical roles in every society. First, we bring together the factors of production to turn out needed goods and services, and secondly, through their employment, individuals develop the capability of obtaining the goods and services that have been produced. The business enterprise, or if you will, production sector, therefore must be cognizant of the political, social and economic environment of the society in which they function. We are as concerned as any other societal sector about the problems of unemployment and underemployment. Indeed our ability to turn out needed goods and services in an increasingly competitive world market rests primarily upon the capabilities of the people who make up business enterprise and I am including all people from top management to the entry level worker. Within this context, the under-development of our human resources is both tragic and wasteful. Whenever and wherever people barely subsist with little or no prospect of living a full, meaningful and productive life regardless of whether that be in a rural portion of the least developed countries or whether it is found in the urban centers of our most developed countries, it is morally, socially, economically wrong. It is therefore not only desirable but vital from any perspective that every member of a society become a part of the economic system functioning at the highest level to which they are capable. I believe that I speak for the employer's sector of any country when I say to you that in order to function we need employees with the best education and training possible. And while so many people subsist at the margin, we have the cruel paradox that there is a dire shortage of trained and educated people throughout the world. The development of human resources to their fullest is at the center of economic growth.

It should therefore not be a surprise to find employers concerned with the quality of education and training. However, the existing system by and large is far less than what it can be. As a result, in the United States, and I suspect in most of the world, a parallel system is evolving to develop the caliber of personnel needed. Peter Drucker, the noted management authority, recently observed that the demand for education is, if anything, greater today than ever before. But what is needed is alternatives to the traditional education and training process. Because so many traditional institutions are not able to break out of their mold, we have business enterprises developing their own training function in-house. Billions of dollars in the United States alone are spent annually on employee training and education. For instance, American Telephone and Telegraph estimated a $1.7 billion expenditure on employee education and training for 1980 involving about 30,000 employees in some 12,000 courses.

Obviously, the business enterprise will always have requirements and responsibilities for a training function. But is a parallel system necessary or desirable? I hardly think so for several obvious reasons: first of all, the education system will always be the initial access point for young people. When that relationship breaks down, that young person is likely to be lost and remain outside the economic, political and perhaps even the social system when they become adults.

Secondly, it is far more cost effective and desirable to work collaboratively with the education section than to attempt to duplicate its function. What all this suggests to me is a call for reform and change not only in the education sector but in all sectors including the business enterprise. The evolution of a system which relates education, training and work strategies that incorporate productive employment in the education process is a logical conclusion that stems from this assessment.

Cooperative education type programs have, in my view, the potential of addressing the questions raised. Perhaps I am in a unique position to make such a statement as I am one of those in this auditorium who has actually experienced cooperative education as a student.

In fact, I would not even be in the business I am in right now if it were not for a start as a co-op student doing that, and I have found over the years that our relationship with the students that we now employ on the cooperative basis tells me that their factors of motivation, sometimes the economic status from which they came, produce good leaders of industry and I have to say that my own experience in this field has lead me to the conclusion that there is no good substitute in our world for the cooperative system of education. This is one of the reasons my own company has been an active participant and a supporter of all of the cooperative education programs. I mentioned to somebody aside last night that we are developing a new problem as the result of our participation with Northeastern and cooperative ventures. We have employed something more than 80% of all of the co-op students who have joined our company, and now we have the unique situation that roughly one-third of every professional we have in the company is a graduate of Northeastern University. We have to be careful not to become a little too imbred.

Focusing on the education and employer sectors only for the moment, the role that each can play does not seem to me to require a radical change on the part of either. Colleges and universities certainly must continue to function as both research institutions and training institutions. With regard to the curriculum, I strongly believe that the educational experience must provide for not only the mastery of technical concepts and skills but it must also develop within all the capacity to conceptualize and synthesize the composition of complex ideas. People must be able to communicate effectively by writing and speaking clearly and reading critically. These competencies should be developed within an understanding of the individual's culture, their heritage and the values of their society. Perhaps this mission was best stated by Alfred North Whitehead who observed: "The antithesis between a technical and liberal education is fallacious. There can be no technical education which is not liberal and no liberal education which is not technical." He goes on to suggest that education should turn out individuals with something they know well and something they can do well. This ultimate union of practice and theory, Whitehead suggests, aids both. It is in fulfilling this part of the educational mission that the business enterprise can and should participate.

Specifically, the employer can provide opportunities for students who work while they are involved in cooperative education type programs. The employer can do this while continuing to encourage the students to complete their education. The employer can also provide appropriate and worthwhile learning experiences accompanied by adequate supervision. For their full-time work force, the employer can provide opportunity and support to enable their employers to continue their education so they reach their maximum potential.

Employers can also enter into close liaison with educational institutions which could include making key members of the employer's staff available to the institution for advice, consultation, and interaction with students both as advisors and even teachers. In turn, the employer could also provide experiences for faculty to consult, as well as even spend longer periods of time with the organization on projects of interest and importance. The enterprise can also provide resources, both financial and equipment, to insure that these institutions of higher education with whom the organization has established a collaborative relationship will have adequate resources to carry out their mission. If operating in more than one country, in addition to all of these opportunities, the employer can provide international experiences for students.

This is hardly a one-way street as the experience of North American employers so clearly illustrates. For the business enterprise there are immediate as well as long-term economic benefits. Let me name a few that we have realized at Connecticut Natural Gas:

1. We have an on-going resource of motivated and well-prepared student employees who perform needed functions with the company.
2. We develop a relationship with the students that translates into many joining the company upon graduation.
3. We have continually found that, as both students and full-time employees after graduation, those with a cooperative education background are very productive and make continuing contributions towards the success of the organization.
4. We are participating in the education as well as the growth and development of the students.

This is, of course, not an inclusive set of benefits. But it represents to me outcomes that are of such importance that the company and I will continue to support the growth and development of cooperative education type programs.

As we begin the final day of this conference, I am certain that we have only begun to scratch the surface on developing an understanding of the problems that will have to be mastered for the wide-spread expansion of these education-work linked programs. It is, however, as I have suggested, a beginning which will result in significant change in the education and training strategies employed, thereby enabling individuals throughout the world--both full- and part-time students and adults in the work place--to realize the best of their innate strengths and abilities.

AFRICAN REGIONAL SESSION

Dr. Abebe Ambatchew
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Regional Bureau for Africa
United Nations Development Program
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Mr. Raphael Sikwane
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United States

Mr. Patrick Chisanga
Assistant Secretary General
Kenneth Kaunda Foundation
Zambia

DR. ABEBE AMBATCHEW: Welcome to the African Regional Panel. I think it would be useful to focus on a number of issues and problems that have been raised throughout the conference, and to identify the implications that they may have for the African region.

First of all, cooperative education as conceived in the conference is based on an expanded industrial base, which means that the partnership concept between industry, government and educational institutions will have to have a very prominent place. This is in contrast with what we have in Africa now, where education is primarily a responsibility of the government. Therefore the integration of education with work, plus the perspective of industry as a major partner in the affair, would raise tremendous questions regarding the applicability of this concept in the region.

Secondly, it is important to keep in mind that cooperative education, understood perhaps in a slightly different way, is not entirely new in Africa. This might come as a surprise, but a few programs have attempted to integrate education with work within the context of academic training. These programs were influenced more by the service concept rather than by employability. In the early sixties, for example, we started a university national service program which sent students from their junior year out to teach in various government institutions, to work in factories, and to build or do other construction work under limited supervision by the university itself. This service was a requirement of their academic training. The maximum that was done was to provide them living allowances, and perhaps some money to buy clothing. They came back in the fourth year, they graduated, but that was it. They were not expecting to be employed as a result of that experience.

This raises several problems. Should the duration of education be five years or the traditional four? How can we overcome the still pervasive elitist attitude of people who feel that this is an interference in their normal academic training? We were very happy to notice a radical change in attitude, however, after the experience of two or three groups. Young people were saying for the first time, "We didn't know our country. Now we do know our country and what its needs are." Nevertheless, we still must consider the strong reservations that exist about introducing a cooperative education system that might extend the duration of education. Are our institutions so conservative that they would resist this flexibility which would allow students to go into the community and do something that is considered to be well below what academic training should encompass? At what levels can we and should we apply cooperative education? in the high schools? the universities?

We must also ask how much of a threat the unions would be to cooperative education. And can cooperative education be applied widely, in the behavioral sciences for instance, or in other fields beyond the technical and medical fields in which it has already been applied?

Finally, I think it is difficult to emphasize what should be done without sharing our knowledge of what has already been done. How much do we in fact know about cooperative education within Africa itself? What are the lessons we have learned from tested experiences? I would like to pose these questions for you, not necessarily to go into their merits but to look at their implications for the region of Africa.

MR. RAPHAEL SIKWANE: I am the Director of the Botswana Employers' Federation, so my interest in this conference is from the point of view of the employer. Although I am not directly involved with cooperative education programs, one of my functions is to insure that employers in my country cooperate with government authorities in all matters that affect business, and this includes training. The industry is the final user of the products of any educational system, whether it be through cooperative education or the classical liberal arts.

Throughout this conference it has been said that any cooperative education program can succeed only if there is a close link, a close involvement of the private sector with the college cooperative education programs. In my experience the employers are very often left out. In other words, colleges and universities conceive these programs without clues or without involving the employer. We employers are only called upon to help when the coordinators of cooperative education programs want to place their students. So naturally, when the students get into a business office they may sometimes face resentment or resistance. Not that the industry is not willing to participate or to assist in training nationals, but it is highly essential that employers be involved right from the beginning.

This involvement can take many forms. You can have advisory committees in which employers participate in the actual formulation of cooperative education programs. These may be chambers of commerce or employers' associations. You need these forums so you can consult employers as a community and find out what they feel about cooperative education programs in general even before you go to the particular industry or firm where you want to place your students. No cooperative education program can succeed unless the employer community is involved in many respects, and the extent to which you succeed is measured both by the number of students you place and whether they get jobs after they have completed the program.

Now coming back to Africa, there are a number of problems here. Cooperative education programs are not a new phenomenon. They exist in certain technical and professional fields and have internship arrangements. What now remains is to examine the role of the liberal arts and the social sciences, which do not have cooperative education programs. Some of our universities have not changed to meet our changing situation. They still emphasize getting a liberal arts degree so that students have an in-depth understanding of general issues. But industry is not looking for this, and consequently these graduates do not find employment in industry. Industry needs people with some relevant training, so that when it absorbs them it will not have to spend a lot of money sending them for the training they should have received at college. So in Africa we still have an educational system which is basically geared to producing white-collar workers.

It is not surprising, therefore, that the unemployment of the educated exists against a background of expatriates from other countries who take jobs because our locals are not there, because our locals are being trained in areas that are not relevant to industry. This is where cooperative education can assist us, by insuring that the people who are sent to colleges and secondary schools have some linkage with industry. Otherwise we will continue to see a serious shortage of engineers and technicians while we spend a lot of money training people for jobs that are not available in industry. So from the employer's point of view we need well-organized cooperative education programs, and this is precisely what we do not have.

There is another aspect to the problem of spending money to train people for jobs that are not available. The linkage between education and industry can only be meaningful if the colleges maintain up-to-date statistics on the number of types of available jobs, and also on the changing needs of industry. Otherwise, even if we undertake these cooperative education programs, we may spend not only money but human resources and end up with the same result.

There are other constraints too. In order for a cooperative education program to succeed you need some industrial base to start with, and a number of African economies are still primary producing ones. We are still turning out a lot of raw materials and unprocessed products, from which many of you are benefitting. Our industrial base is very, very small, and the extent to which we can conceive programs is limited by that smallness. This is not to say that we should fold our arms and think that there is no future, but there is no way at present to insure that the few nationals whom we train are trained for specific available jobs and not for jobs that were thought to be there while in fact they are not.

MR. PATRICK CHISANGA: I represent the Kenneth Kaunda Foundation of Zambia, which is the monopoly supplier of all education supplies ranging from textbooks and teaching aids to equipment, so it is important for people like myself to keep abreast of the trends and projections in education.

Let me first try to define my understanding of cooperative education, so that I can be clear in my own mind as to the direction in which I am moving and can carry you with me in that direction. As I have been able to infer from this, my first visit to the United States, and from this conference, cooperative education is an integrated approach to education and basically encompasses three ingredients: classroom theory, the work experience related to the classroom theory, and the employers. Therefore, for cooperative education to work meaningfully and effectively there has to be this tripartite arrangement, and it must be well organized and consolidated.

I would like to extend the role of the employer a bit further in my perception of effective cooperative education. The employer must be a part of the training process. He must have a direct interest in the student who is brought to him. Otherwise the time that the student spends in that particular employing organization will not have been meaningfully spent and may even have been wasted.

It is difficult to generalize about applying a scheme like cooperative education in a continent the size of Africa, where there are varying ways of looking at things and the regions are at different levels of development. We have semblances of a cooperative education system, but not nearly to the extent to which it is applied here, where it is very much a formalized and closely monitored and applied system. In certain professions we have what we call an industrial break, a time during the vacation when the student, if he is fortunate enough, can be attached to a company or organization related to his field of study. But it is not the responsibility of the teaching institution to place him. Most of the time he has to make his own personal efforts. So against this background I want to focus on some specific implications of applying a more organized and strictly monitored cooperative education system in Africa.

First we have the question of acceptability. Cooperative education introduced a complete change into the education system, and human beings, being what they are, strongly resist change. Will cooperative education be accepted by the governing authorities? by strictly monitoring the students who are sent to them in this organized arrangement?

The second problem relates to the present nature of African economies, which are still essentially agrarian-based despite a new thrust in the industrial sector. The scope of employing organizations, therefore, is limited both in physical existence and in availability of highly skilled and trained employers who can train others. This is a dilemma specific to Africa. Most of our farmers are subsistence farmers who do not have the techniques of modern agriculture nor that knowledge of high level agricultural technology which they could meaningfully impart to students. The same thing applies in industry. At the moment we have to rely a great deal on expatriate labor in industry and in medicine. But the expatriate professional who comes to Africa expects to do a job, earn a salary, and then go back home. He does not expect to play schoolmaster in the industry in which he works. So we do not have a ready availability of highly skilled employing agencies that can impart their knowledge effectively to the student.

The third question involves the time spent in the schools. Africa is a continent in a hurry to forge ahead, and any change which is designed to have a delaying effect on this process of forging ahead is likely to be resisted. The one-year extension in the education time period can be considerable, because it means to the student that he stays one more year in school before he can qualify. To the authorities that run the education institutes, and in Zambia they are almost all state-run, it means that the resources for training other students are restricted by the fact that people have to stay longer in the education system before they can get out to make room for others. This is an element of constraint that will be resisted because it delays the process of forging ahead.

In conclusion then, given the general consensus that cooperative education is a positive educational concept and that Africa stands to gain a great deal by applying it in a modified form, and taking into full account the various implications that have been identified, cooperative education cannot succeed in Africa if its present form as applied in the United States is merely transplanted or dished out to Africa. Cooperative education has to be modified a great deal to suit the environment of Africa, the limitations that Africa faces, and Africa's own special problems. This is the way I see the trend if it has to come.

DR. AMBATCHEW: All of you have been participating in different sessions, and I am sure you must have gathered some impressions about the problems that we might encounter in applying cooperative education in Africa. Therefore, I would like you not only to ask questions but to air your own views on what the implications of cooperative education could be for Africa.

DR. SALAH AYOUB: I am from the International Labour Office and I come from the northern part of Africa. One of my concerns since I arrived here in Boston has been that cooperative education in the United States has a somewhat limited scope. I see cooperative education for Africa in the wider sense of the association of people who are taking courses where they work. In other words, I do not see cooperative education as only limited to students at the university level. In Africa this would be very dangerous, because only a very small number of people have access to university education. Cooperative education should extend to the lowest level, to the primary and secondary schools, and to vocational training. In this broad context it would make sense for Africa.

Furthermore, everybody talked about the narrow industrial base. I would widen that base a little and say economic base. If you are an accountant, for example, you can work as a practical trainee in a bank. Cooperative education is not solely for industry.

I fully agree that we cannot simply transplant the system as applied in the United States. We need a completely different type of teaching style and curriculum, and this will have an impact on the training schedule, the educational schedule, and other timetables. We must also take into consideration that the governments, not private industry, are the largest employers in Africa. And I think that because of this, cooperative education will be accepted more easily than if the largest employers were in the private sector, provided of course that the governments are convinced of the merits of cooperative education.

SPEAKER FROM AUDIENCE: My point is directly related to the first presentation. I want to inquire whether in many other countries the Employers' Federation that you represent would consider it an unacceptable financial imposition if it were expected to cover the major portion of the costs involved in cooperative education programs however they were defined. If that would be the case, then do you see it as the government's responsibility to find funds to cover the costs?

MR. SIKWANE: The success of any cooperative education program will likely depend on the extent to which it is accepted by the employers. An employer is a businessman. He wants to make money. If he can avoid anything that is going to increase the cost of production he will naturally do so, and there are a number of ways which can insure that the employer does not unnecessarily increase his costs. One of them is for governments to allow the employer to deduct from his income taxes any expenses incurred in on-the-job training of cooperative students. But it is not unusual to find that in certain government situations on-the-job training expenses may not be deductible, so that by and large employers are willing to accept the students as long as the students will not increase the cost of production. So one does not only need to involve the employers, some financial incentives are necessary to insure that the employers do business and make money, which is their main purpose.

SPEAKER FROM AUDIENCE: The modern industrial sector is heavily western oriented. Much of the profit leaves the country. Now cooperative education trains manpower for industry, and by doing so the employer, who is already benefitting by various kinds of protectionism, is getting another benefit, especially if he is aided by the government. We do not need this. What we need in Africa is the retooling of our surplus liberal arts graduates. Furthermore, cooperative education is dysfunctional if it remains at the higher lever. We must bring it to the secondary and elementary levels so that it reaches the bulk of the population and gives them an education. In black Africa the literacy rate is only about 36%. This, to me, is where the serious economic problem lies, not in the lack of cooperative education per se.

MR. SIKWANE: You raised the issue of retooling people who may already have some kind of academic training. Some business firms do identify some students before they graduate, and take them in upon graduation. These people work for two years, for example, and then the firm sends them abroad for further studies. When they come back the firm employs them. This is one way of making their experience and their education relevant to their basic academic background, which serves them not only in their company but in others. I think there is a lot of merit in this approach.

SPEAKER FROM AUDIENCE: Perhaps I have a unique advantage in that I am an American who has worked a number of years in Africa, and hopefully I can see both sides of this issue. First of all I want to clarify a point. Cooperative education does exist other than at the higher level of education in the United States. In fact it exists in some high schools with great force and vigor.

Returning to Africa, I am sorry to say that my greatest burden when I was there was the very fact that you have an education system that produces something that has to be refitted, the educated unemployable. That is the greatest waste. It is a tragedy and a scandal, and it makes me feel badly because African governments invest a far greater percent of their gross national product in education than anyone else and they get too little from it in terms of development. We educators have to sit down and look at the national plan because this is where I see the dyslexia. What do all our examinations mean? I used to teach in a secondary school and I would turn out people who I would meet two years later walking in the street with still no job, nowhere to go and nobody to muse with. This hurts, especially after the expectation you had that there was some gold at the end of that rainbow. Education is a social processor and it must be relevant. We have not won yet, but at least in Africa you are not suffering extensively from the problem of gross or crass imitation.

SPEAKER FROM AUDIENCE: I would like to respond to the comment that cooperative education is dysfunctional because it does not reach a large mass of those who are illiterate. I work at a two-year community college. Most of the students who come to us are illiterate even though most of them have a high school diploma. Many have never experienced the work world. I have been hearing the assumption that once students have gone through a cooperative education experience they are permanently placed. Part of our program is for students to at least experience a given work focus without necessarily placing them permanently on the job. In this way we at least have an on-going cycle of work experience, and we are tapping a part of that population that may not otherwise be in the work force. In this sense cooperative education is very functional.

SPEAKER FROM AUDIENCE: I am the Dean of the African-American Institute of Northeastern University, where there is a ten-year-old effort to bring into the educational process students who were not in a white university before the death of Dr. King. I have been there for three years, and one of the things I am learning is that our students in business, engineering and a few other areas are off into the mainstream of things, and that is fine. But there is another block of students whose situation we are not addressing very well. I think it parallels to some extent our situation in African settings, and that is the failure to develop an economic plan that builds on the aspiration and goals of those in our community who are not in the formal, industrial sector. How can we tailor cooperative educational development so that it is more in line with the economic planning and goals that are not necessarily targetted to the large corporate sector?

SPEAKER FROM AUDIENCE: I would like to give an outline of the way Zambia has looked at that problem. Most governments in Africa, and certainly that in Zambia, realize that the way our economies were organized is not the way we are going to develop. In order to restructure economic planning you have to go back to the educational system, because that is where it starts. We have embarked on an ambitious program to completely rewrite and redefine the educational goals of the country, and we have designed a new education system which we call Education for Development, which emphasizes relating education to the developmental goals of Zambia. We start by dispelling attitudes in the students' minds. Even the school uniform has changed. Students are ready to work as well as to learn. So we are restructuring education to relate it to the economic needs and aspirations of the country.

DR. AMBATCHEW: Before we finish, we should note one thing in relation to the development of education and the process of development itself. Many African countries are now very much involved, and the results are encouraging. They are establishing what are called by different names institutes of development, which are basically geared to looking at concrete development problems of the countries. International financing has been receptive to that. The countries have established a lot of cooperative arrangements with institutions abroad. In other words, there is a move away from the isolation of higher education toward an increasing awareness that institutions of higher learning in particular have to serve the concrete needs of the country, rather than the whims of the individual. In fact, in some cases there are forced entries into disciplines. I was almost a victim to that.

ASIAN REGIONAL SESSION

Dr. Lydia Profeta
President
Rizal Technological College
The Philippines

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DR. LYDIA PROFETA: Let us examine the plan for Human Resources Development in Asia, particularly in the Philippine setting. In the underdeveloped, or developing countries of Asia, the typical situation is still one of poverty and insecurity. The growth rate of the population is still high, although much effort has been expended to achieve population control. People still prefer white-collar jobs and exhibit negative attitudes towards the lower level skills needed for economic productivity. Society is stratified according to academic achievement, so much so that degree holders are considered first class citizens and the graduates of vocational schools second class citizens. One reason for this is that most of the formal educational systems in Asian countries were strongly influenced by European and American colonizers. While the total unemployment rate in the Philippines has shown a downward trend of 3.2%, unemployment is still typically worse among the young in urban areas and slightly worse among females. Unemployment rates tend to be higher the higher the level of educational attainment. The situation is aggravated by a mismatch between the educational system's thrust and the economic development needs of the country as reflected in the high rates of schooling and low rates of GNP growth. Foreign and local industries generally align themselves only with Ivy League institutions, while smaller ones with limited training facilities have to fend for themselves so that their students can attain a modicum of training skills and experience. The most common industry input into education is a scholarship to deserving students. The responsibility for on-the-job training has not been generally defined, nor the specific role of schools and industries coordinated or properly monitored. There is no formal mechanism to provide labor market information whereby positions open and skills needed by industries are communicated to educational institutions. 95% of higher education is in the hands of private, profit-oriented institutions, and 5% is taken care of by smaller state institutions. The concentration of educational institutions and major industries in urban centers has resulted in underemployment, unemployment, and a very high density of population, thereby causing problems of health, sanitation, peace and order. Critically needed manpower migrates to richer countries which offer greater opportunity and higher pay. This uncontrolled migration of vital human resources is a gift from poor countries which cannot afford it to rich countries with transitory needs for it, or who do not need it at all.

While developing countries opt for a shift from a capital-intensive economy to a labor-intensive one, labor does not yet have the positive attitudes toward working and learning which would make the transition more meaningful. Labor has no initiative to improve the quality of its manpower; neither has it programmed strategies for lifelong formal and informal education. Regional dispersal of industrial as well as educational institutions has been planned, but consideration has not been given to the psycho-social factors, the traditional values that often are deterrents to manpower development strategies. This is understandable, as the Asian essentially resists change and clings tenaciously to his cultural practices and religious beliefs engendered by the years.

The ten-year development plan envisioned by President Marcos gives priority to the extensive use of the mass media and the use of technology packages and services for regional development. The task of educational and training institutions is not just to improve the productability and employability of people, but also to build their capabilities to create by themselves new opportunities for fulfilling their human needs from the resources around them. Thus, the educational system must be relevant, and relevance must be measured by the extent to which the system promotes and supports action designed to alleviate the grinding poverty of mankind and to reduce the enormous gap in income between the rich and the poor. Industry and business should link themselves with developing or underdeveloped educational institutions so that quality education for the disadvantaged can be effected. This will minimize the ethic of elitism, and ultimately the basic human right to education and opportunities for survival may be open to all regardless of sex or station in life. More women should be mobilized for full employment as co-equal with men. Psycho-social factors that may be possible deterrents to innovation should be redirected towards positive implementation of countryside development. Those cultural patterns which make life meaningful and rewarding must be strengthened so that when economic need has been met, the total individual will emerge a happy, confident and self-actualized member of the community. The commonality of psycho-social values of Asian countries therefore calls for an interlinkage of programs with a base of cooperative education in this part of the world as a means of producing the qualified manpower so vital to economic development.

I would like to cite two notable Philippine cases representing urban and rural experiences in cooperative education. The Rizal Technological College, mandated by law to be the center for cooperative education in the Philippines, concentrates on urban, industrialized clientele. Originally patterned after the American experience in cooperative education, the program has begun to acquire a local flavor of its own. Modular courses provide students with basic specialization tools in their first two years before they go to their work outside the school. Modular courses also insure that school leavers have basic employable skills and knowledge. Summers and evenings are programmed for the liberal arts and other courses required by the Philippine educational system. As a requirement for graduation, all cooperative students must spend a whole summer in community work where they share their knowledge and skills with the disadvantaged or the senior citizens in the villages.

We also have a National Agricultural College which has embarked on a bold experiment. If the students cannot come to the school, the school will go to the students. The students learn from actual work, earn from their produce, and either save part of their money for their academic schooling or invest in cooperatives to increase the whole family's income.

From the two cases I have cited, these key concepts have emerged which educators and school administrators may use to advocate changes in their educational and manpower development policies: 1) active linkage of educational institutions with government, industry and community for a better fit between the school and its environment; 2) primacy of people's needs as the basis for livelihood and employment programs tailored to the country's need, the end in view being to improve the quality of life; 3) conscious effort to recycle human capital resources directly into the local and national economy by building people's capability to create opportunities themselves; 4) outreach as an effective strategy for delivery of educational services to those who need them most; 5) a data bank to put information into perspective and from which to derive workable goals for the country's learning institutions and students; 6) foreign exchange programs for both faculty and students, particularly cooperative supervisors and counselors, so that cooperative education know-how can be shared; 7) an Asian resource development, research and audio-visual center for scientific research and the production of materials to enrich cooperative experiences. The center could also serve as an international labor force exchange and placement center.

If we want and hope the conditions of the world to change for the better, we must all join hands in the active advocacy of reorienting human resource development policies to benefit the poor, the disadvantaged and the handicapped peoples, particularly in the developing nations of the world. It is our intellectual and ethical duty.

DR. ROBERT S. DAVIE: Although Australia is associated geographically with Asia, it differs from its neighbors in a number of ways. It has a culture which has developed essentially from western civilization, and it has the unique combination of a comparatively low population, a large land mass, and long distances between the major urban centers. Within the region, Australia stands as a potentially stable western-style culture with resources which include high primary production, mineral wealth, substantial energy resources with the exception of oil, and a well-educated population with high living standards. Despite the differences in cultural background and internal structure, mutual interests have arisen from proximity and have led to links between Australia and its Asian and Pacific neighbors in a number of areas which include trade, defense, and education.

Australia has sought to contribute to the growth of the developing countries particularly in Southeast Asia, and as part of this has made college and university education available to a number of students from countries in the region. The provision has existed for a number of decades now, and is being made with the intention that the knowledge required by the foreign students will, in turn, enable them to contribute to development in their own countries. This aim is only being partly met, because many students have continued to live in Australia as expatriates, so that both they and their acquired knowledge have been lost to the development of their native lands. Within the last eighteen months Australia passed legislation designed to minimize this trend. Its effect remains to be seen, but the intent is quite clear. People should take their knowledge back to their own countries and use it there.

The question is whether the education generally provided in Australia is the most appropriate. Conventional full-time programs are the norm. There is a community expectation that able students, and even those who are not so able, will continue as full-time students from kindergarten to at least the first degree level, and most programs are designed on that basis. We did not have the widespread flaring of cooperative education which was seen in the United States and Britain over the last two decades, although cooperative education did get its toehold in Australia at that time, and we do have some very strong programs. Government attitudes generally, while not actively opposed to the cooperative concept, have provided little encouragement towards implementation, although through the adoption of a passive role have allowed a few pioneering teaching institutions to establish cooperative programs in engineering, science and business. The interest of other teaching establishments in cooperative education is now growing.

For indigenous students, cooperative education helps break down the isolation which exists between education and society, and is a prime means of enabling students to achieve social maturity and to integrate readily with the society. Foreign students are doubly isolated, however, both by their initial education and then by their education in a country remote from their own and one in which different cultural systems apply. Almost invariably these students get their work experience in their host rather than their home country. The exceptions that occur are few, and require substantial individual organization. The problem is compounded by the need to restrict the number of expatriate students in Australian cooperative programs to the limited number of work places available in the host country for temporary residents. A balanced program which includes academic experience in the host country and work experience in the home country would overcome the problem of finding work experience for foreign students and the other problem of loss of identity with the home country for foreign students studying abroad. The graduate from such a program can never again be unaware of the human needs in society, and this is perhaps of particular importance in developing countries, where the future leaders are most likely to be drawn from the wealthier groups which are themselves isolated from the general community. Cooperative education is a proven bridge between potential managers and those whom they will later manage.

This is not to suggest that extending this bridge into developing countries will be an easy task. Many of the education leaders in developing countries are products of traditional full-time programs, and their sympathies lie with the kind of education they have themselves enjoyed. To mount cooperative programs under these circumstances would be an operation fraught with difficulty, whereas a more gradual process might bring success. Already some students are obtaining academic experience in Australia and work experience in their home country. What is needed is not sporadic action, but a coordinated plan of this nature involving both countries. This might eventually lead to the development of totally integrated cooperative programs between the two nations, and finally to the acceptance of integrated cooperative programs in the developing nations themselves. But the countries must first realize that cooperative education is desirable, be willing to embark on it, and countries already in the field must be willing to provide the experience needed to guide this new development.

Ultimately, while the development of nations is critically influenced by physical resources, the most important single asset is still the human resource. Cooperative education offers a major and a currently very much underused strategy for realizing the maximum potential of people.

SPEAKER FROM AUDIENCE: Sending your teachers and occasionally your industrial people to cooperative programs would be very profitable. Nevertheless in Asia the spenders are not being controlled. That is a social problem which no cooperative education is going to solve.

DR. PROFETA: We in the Philippines send our people abroad only for areas where there is no collegiate offering in the Philippines. There is a government restriction in regard to that. As a matter of fact, the people we send out are for those areas like the new technologies for which we do not have the manpower, and we expect them to return and train our people.

DR. DAVIE: We have a number of expatriate students who do their work experience in Australia, and I am suggesting that they would be better served if they do their academic study in Australia and their work experience in Asia. Ultimately one hopes that the majority of them would be educated in their own countries. This would be a much more helpful way of development, but it has to be a gradual process.

SPEAKER FROM AUDIENCE: My name is William Harris and I am from the South Pacific. Let me say that if the employer is not a trainer, then he is not really being supportive of the cooperative education program. In our own homelands we really do not have the kinds of employers who can be trainers, and we need this. I would be hesitant to send somebody from a classroom experience back to his environment in my own homeland, because I see something lacking, and that is the work supervisor who can be a trainer.

DR. DAVIE: I think I wouldn't emphasize the training aspect of the work experience. The student should not be there as a trainee per se, but as a person who is employed to do useful work at a level which is appropriate to his academic background and relevant to the course he is following. I do not feel that in a number of Asian countries there would be a tremendous difficulty in getting that sort of work experience. You are saying that in some it would be difficult, and I accept that. But in many others there are sufficient opportunities.

SPEAKER FROM AUDIENCE: I agree with that, but the harsh reality is that most industries are productive organisms, so when you place a student for this kind of productive work, the employer's first consideration in many cases is how productive this job is going to be. So unless the trainer has the interest of the student in mind, there is a tendency to place the person where he will be the most productive, not where he will learn the most.

SPEAKER FROM AUDIENCE: I am here as a representative of a major Austrian exporting company that has a number of major projects in the Philippines. It strikes me as very odd that whenever we advertise for highly qualified welders, for example, the people who apply are mechanical engineers who never have had any exposure to industry and do not have the skill required. We do not get applications from people who can do the job. We try to work with local institutions, but where there are none we have to do it ourselves. We train a large number of Philippinos back in Austria who are supposed to go back to their country and pass on what they have learned. This seems to be a working solution as far as our country is concerned, but something must be wrong with your educational system because when we advertise for a welder, no welder will apply.

DR. PROFETA: As I said before, we have an oversupply of college graduates, but we lack people who graduate from vocational or technical schools, because the first place they go is Saudi Arabia. That is why those people who apply for positions are the bachelor degree holders, and that is why our educational system is now realigning its thrust to coincide with our economic development needs. But cooperative education is not yet acceptable to many institutions. Eventually we hope to make them come around to our view so that we can provide the manpower needed for our economic development.

SPEAKER FROM AUDIENCE: I am from Hong Kong and I notice that in developing countries the children grow up without any feel for engineering, unlike in western countries where the father repairs the car or at least takes the vacuum cleaner apart and fixes it. In the Chinese home there is no such tradition. It is certainly not done if you have a degree.

SPEAKER FROM AUDIENCE: But I think that Hong Kong industrially could be considered developed, although socially there is a great disparity between the university graduate and the worker on the assembly line, or am I wrong?

SPEAKER FROM AUDIENCE: Actually the disparity is not as great as one might think.

SPEAKER FROM AUDIENCE: I notice that in most developing countries the social status of people who are working with their hands is low. I think this is universal, but it is not so obvious in the German-speaking countries where an apprenticeship exists. Most developed and developing countries lack this kind of training scheme. So when we find people who are skilled workers by your standards, they are not skilled by our standards. They are not even semi-skilled. They have never learned a trade to the point where they can do it in a competent way without supervision, know where the trouble is and how to get rid of it. The skilled craftsmen who are very high in our country's public opinion are not there in your country. So perhaps you should have a similar scheme that produces that kind of a craftsman who everyone would recognize is the backbone of industry. Unless you have that, you cannot possibly set up an industry.

DR. PROFETA: We have started that at the College of Industrial Technology, but our difficulty is to get students to enroll in these programs. They always opt for a collegiate degree. Furthermore we lack machines, so we send students for on-the-job training to the industries that have them. We have written to several countries which may be able to give us some machines that our students can use, but we have not yet received any help from them.

SPEAKER FROM AUDIENCE: Madam Chairman, may I suggest that it would be good to continue this discussion at the Third World Conference?

DR. PROFETA: Yes. Thank you all.

EUROPEAN REGIONAL SESSION

Dr. Thomas H.J. Stoelinga, Chairman
Chairman, Netherlands Council for
Higher Professional Education
The Netherlands

Dr. Michael Adams
CEDEFOP, European Center for the
Development of Vocational Education
Germany

Mr. Björn Grünewald
Swedish Employers' Confederation
Business and Industry Advisory Committee
to the OECD
Sweden

Dr. D. Walwyn-James
Director, University of Malta
Malta

Mr. James Platt
Central Bureau of Educational Visits and Exchanges
United Kingdom

DR. THOMAS H.J. STOELINGA: I am Chairman of the Netherlands Council for Higher Professional Education, a body of representatives from institutes of higher professional education that advises the government on all matters relating to higher professional education. All programs at these institutes are based on cooperative education.

Our perception of the practices of industry, labor, government and education is changing, and we must structure a new relationship between education and the community. The purpose of this session is, in fact, to design a proposal for developing the human resources and meeting the employer manpower needs of Europe. This is very ambitious, as differences between the European countries are in many respects significant. Therefore the means of solving the problems related to economic and social changes will differ from country to country, or at least from sub-region to sub-region.

In the past ten years there has been a growing demand for post-secondary education in the age group from 18 to 22. Many countries have, in turn, developed policies to admit those who are qualified and willing to pursue higher education. Consequently, the student population in some countries has grown considerably.

Since the economic recession in the late '70s, however, these graduates from higher education have increasingly found themselves unemployed. At the same time, the institutes of higher education are facing a decreasing enrollment in the traditional age groups due to the declining birth rate. As a result it may be necessary to cut staff, departments will be contracted, and institutes even closed. These events coincide with a growing demand for manpower by work organization. For these reasons the institutes are exerting themselves not only to develop new interdisciplinary programs to improve their present students' employment mobility, but also to attract new students.

A new category of students, one consisting of adults, is becoming a significant part of our student population. These adults differ from the traditional students not only in age but in the way they want to use their educational opportunities. Institutes are finding that they have to develop interdisciplinary and refresher courses, evening and weekend courses, and recurrent and continuing education programs to meet the needs of these older students. They have to introduce new teaching methods such as computer-assisted instruction, audio-visuals and other materials.

These programs which meet new student demands and which also prepare them for the needs of trade, industry and non-profit organizations can only result from an interaction between employer organizations and the educational institutes. In this way cooperative education, by the very nature of its strong relationship with employer organizations, can invigorate the many sectors of public life and fulfill the needs of both industry and older organizations in a rapidly changing world.

DR. D. WALWYN-JAMES: I am currently Director of the University of Malta, and I think the changes that have taken place in higher education in Malta over the last three years illustrate many of the themes of this conference. I would like to give you a brief report on Malta so that it might serve as a model.

Malta is a peripheral European country which is historically and culturally linked to Europe. It is not a Third World country, but it is still very much a developing country. During the last three years there have been considerable, indeed radical changes in the style and pattern of higher education. These changes have been closely linked to political events, which have resulted in the emergence of an independent state seeking economic and social viability.

During the post-war period the Maltese economy depended largely on Malta's role as a military base under arrangements made with Britain, whose colony Malta was, and NATO. It was, nevertheless, a fundamental part of the Malta government's policy that the use of Malta as a military base should cease at as early a date as would allow Malta to gain economic independence from the operation of the base. Military base operations finally did cease on the 31st of March, 1979, by which time Malta had become a republic.

In anticipation of this the Malta government had created and activated a development plan which contained a whole stream of economic and social objectives appropriate to Malta's new and growing needs. On the economic side, foreign exchange was to be earned by intensive development of activities in manufacturing, moving away from labor-intensive to more technological-type activities, and giving considerable attention to ship repair, shipbuilding, and the more efficient development of agriculture, fisheries and tourism. On the social side, plans were laid for the sustained redevelopment of back-up services in education, health, social and public services in general.

Higher education in Malta prior to 1978 had been carried on in two institutions: the Malta College of Art, Science and Technology, otherwise known as the Polytechnic, and the University of Malta. The Polytechnic had been largely concerned with full-time vocational courses in engineering, business studies, and education, and offered a degree, diploma and certificate level respectively. The institution maintained strong links with industry, commerce, professional bodies here and abroad, and it was responsive to community needs. The University, which had been founded in the 16th century and was the oldest university in the Commonwealth outside the United Kingdom, operated along traditional lines and offered professional full-time courses leading to degrees in law, medicine, surgery, dental surgery and pharmacy, as well as the general arts and sciences. It was remote from the requirements of national development and poorly placed to respond to them.

Malta's development plan demanded a reappraisal of the higher educational support system and the establishment of new courses to produce appropriately-trained graduates to meet the requirements of the plan. Accordingly, the government enacted a two-part attack which has resulted in the creation of a new university, "The" University of Malta, which combines selected elements of the former Polytechnic and the former university. And associated with this institutional change were fundamental changes in the pattern of courses offered and the funding of students. The courses are "Worker/Student" sandwich courses, or cooperative education programs. Each academic year contains two equal semesters, approximately 5½ months in duration. One is devoted to academic study and one to work. All students are sponsored and paid a salary by their employer, who may be in government, private industry or commerce. Periods of work experience are linked with and alternate with periods of academic study. Employment upon graduation is guaranteed.

Thus Malta has entered into a higher educational program which is entirely based upon a blend of study and work experience, and in this respect it is planned that the students will gain experience in the application of their subjects in the work phase, and a knowledge of the problems that arise. Upon graduation they will be more readily assimilated into the professional work force and more aware of the practicalities of situations which they are likely to meet. The payment of a salary to students insures that no one is banned from entering the university due to financial constraints, and that is an important factor in Malta. No tuition fees are charged, and university entrance requirements have been made more flexible so as to allow those with technical qualifications, regarded as broadly equivalent to the normally required "A" levels, to enter the university.

At present the university contains six faculties and is running a dozen worker/student cooperative educational programs in dental surgery, engineering and architecture, education, law, management studies, and medicine and surgery. All academic departments have established growing links with appropriate government departments, industry and commerce. Students do project work in consultation with these bodies so as to project academic knowledge into practical problems. We encourage departmental staff to carry out research and development work in cooperation with external organizations in order to bring the university into the mainstream of national requirements, and external members serve on the various faculty boards to add flavor and relevance. An external examiner system insures that the courses are in line with international standards. Their reports for the first three years of operations are encouraging.

Thus Malta is probably the outstanding example of a small developing European country with limited resources, which during the last three years has successfully related university education to its economic and social development needs. All the courses contain an equal blend of academic study and work experience. The courses are dynamic and will undergo continual modification to insure that the combined effect of study and work on student development is as effective as possible. We are constantly seeking ways to validate work experience and relate it to the flow of academic content. Thus, students and staff have entered the mainstream of the national development plan instead of standing apart from it. This bodes well for the future and will insure the realism of the University's academic program.

MR. JAMES PLATT: A representative from another of those peripheral European nations, the United Kingdom, is now going to speak. First I will move swiftly through a number of professions, and then give you two brief and hopelessly inadequate summaries of the situation confronting us. The Pre-Professional Training for the Teaching Profession provides by far the world's largest mobility for young professionals in the foreign language assistance scheme. In Britain alone the Central Bureau has been responsible for up to 7,000 full-year appointments of foreign language teaching assistants, foreigners coming into Britain over the past 15 years from 75 countries covering 20 languages, exploding perhaps part of a small myth about British indifference to other languages. At this moment we have 2,592 English language assistants placed abroad for the year as part of their initial training as teachers of modern languages, but who are increasingly looking to careers in government and diplomacy.

The French Ministry of Education has come to its industrial senses in the past year by passing a regulation which will oblige new teachers of all kinds of subjects to spend six weeks during their training course working in an industry other than the education industry. We at the Central Bureau will be making the placements of those who are to be sent for that training to Britain.

The Central Bureau also operates an almost world-wide teacher exchange program. In the United States at this moment there are 150 teachers on a full year's exchange. We also have unilateral appointments with an increasing number of countries including those of Eastern Europe and one or two Middle Eastern countries, intensive study visits, reciprocal study visits and bilateral cooperation study visits to a number of countries which Britain feels it has much to learn from and something to teach to.

We already have a pre pre-professional training program which places high school seniors in a number of countries as English language assistants for summer language camps. Poland, Hungary, Turkey, and Austria are currently within that program and Egypt has asked to be included. Gradually these young people will spread out during the summer months to many other parts of the world.

Young people going into government and diplomacy, on the otherhand, cannot afford to take advantage of the foreign language assistance program, but the British and French governments have within the past five years invented a scheme which brings together young graduates and mid-career persons from the Ecole Nationale d'Administration in Paris and our Civil Service College. At this very moment a group of senior French civil servants is pursuing a one-month course at the Civil Service College in London.

An occupation you might not expect me to mention, physical education, is becoming increasingly the basis for pre-professional training and in-service training placements. In Britain the Center for International Sports Exchange, which is based at the Central Bureau, has a special mission of placing foreigners coming into Britain to be trained, and British people going abroad not only to be trained but to act as administrators and coaches. This can have an immense impact on public health programs, as we can see by looking at the southern region of the Sudan, where sports, physical education, and public health programs are closely linked and where young people will be sent in the next few years as part of their initial training as sports and physical education teachers as well as administrators.

In addition, the Center for International Sports Exchange also runs the only courses so far for Olympic Sports administrators. In an important and much exposed profession, they now need the best possible administrative skills that can be given to them, and we have one-month courses every two years for them. So far we have trained people from 76 countries around the world, mainly developing countries, in the business of organizing sports and physical education under some rather difficult conditions.

Business and commerce, industry and technology, have their own international schemes. They are far from adequate, however, to meet the needs. There is AISEC, business and commerce, and another for industry and technology. They do have a widespread geographical network, about 50 countries being covered by each of these international organizations, the U.K. branches of which are based at the Central Bureau and are in charge of all of our work on that front.

Education in the U.K. situation is principally characterized by the sandwich mode operated by 31 polytechnics, the 9 technological universities, and by one or two departments in a scatter of other more traditional universities. This has given rise to what I think is probably the world's only cadre of full professionals in this field. The industrial training officers, directors, professors in one or two cases, have come to grace that field, and indeed to make a very important impact upon the relationships between education and working life that was not noticed, certainly not developed 10 or 15 years ago.

In science the situation is easier in that how and where you train is much more specific. The difficulty arises from the fact that the mechanism for arranging international placements for scientists, those going into chemical engineering, for example, hardly exists. Much has been left, therefore, to the individual effort of interested heads of departments in the universities and polytechnics, with UNESCO playing a notable part in recent years, particularly in its international forum in Toronto two years ago from which sprang the triangular scheme between Britain, Australia and Canada. The students of medicine have organized themselves a junior internship program which works extremely well though for rather limited numbers of young medics. In agriculture there is a European scheme for the exchange of young agricultural workers, small numbers again, measured in 200, 300 or 400 each year, but nonetheless having an impact in the European community countries on methods, attitudes and investment programs in the agricultural industry.

Social workers have the Council for International Programs for Youth Leaders and Social Workers, through which young people in those professions can train for six months in another country on an exchange barter basis. Its European headquarters is also at the Central Bureau.

Very little has been done for young cultural workers and young artists in the past, but we now have a scheme going through the Council of Europe in Brussels, which will lead in a year or two to a European cultural assistance scheme in which young people under the age of twenty-five who specialize in one or other of the performing or graphic arts can spend a year as a cultural assistant in one of the other countries.

For young workers there is a new mobility scheme which is being financed by the EEC in Brussels to enable young workers to go abroad for varying periods of time. Generally for youth in the field of service, the opportunities to see how one's job is organized and carried out at benches, in factories and in offices in other countries are relatively few, but some very notable work has been done by a number of agencies in this respect. I think the Karl Duisberg Gesellschaft of the Federal Republic of Germany is one of the great European leaders.

International links are certainly the key for institutions. Each country needs something like the national forum that we have in Britain, which does research, disseminates information, and brings pressure to bear upon government. We call our forum SCOPE, the Standing Conference on Overseas Placements and Exchanges, and it brings together all the interested institutions and organizations. Information is absolutely vital. The greatest lack is the lack of information about opportunity in all the European countries save perhaps the United Kingdom, although two publications do help in this area. They are Working Holidays Abroad and Higher Education Exchange.

As a general remark, Western Europe, probably mainly through the EEC and using the main convention funds, could certainly cooperate with other regions such as Africa, India and Southeast Asia. A variant on this would be the utilization of other existing networks, for example the Commonwealth, in the form of a pool system. All current schemes for training placements are extremely expensive; there is a need to reduce the per capita costs if the system is to be democratized. A pool is probably the only way, certainly the only way which requires little or no cash funding, in which shall we say India could profit from and contribute to an international exchange of young professionals. Other possible networks are the Council of Europe, the Nordic countries which already have a labor mobility program, the U.S.A. and Canada, the Organization of American States and the Arab League. Were such networks to formalize themselves in this way, it would be much easier for all of us to look forward to a very greatly expanded structure of preprofessional or in-service training for young professionals. What is needed is not so much money as imagination, and the determination and ability to design and then to manage schemes of exchange, interchange, and co-operation in this field. The tens of millions of dollars now being spent on providing training to young nationals of other countries is not badly spent if we judge them by traditional measures. If, however, we were to wipe out all existing schemes and retain the money now being provided for them, we could offer five or ten times the number of placements for the same cost through this new cooperative pooling system in which each country would put into the pool and take from the pool.

France and the Federal Republic of Germany have a government and industry coalition for international training, the benefits from which include the status and good name of the donor country, invaluable as an instrument of diplomacy, privileged access not only to markets but also to natural resources, and embrace sales of goods and services. And what countries other than these two have found cash support that such programs demand? This should encourage other countries to work out a national policy, funded at an appropriate level, to develop the organizational skills needed for the neat matching of trading needs to training placements. In Brussels at least there is now a whiff that such a development will enhance labor mobility and promote European awareness through the acquisition of European skills in one's occupation and in one's social life, the two types of skill essential to a satisfactory program of mobility.

We must act now, otherwise the next World Conference, if we are not very lucky, will take place in exactly the same circumstances of neglect, and the training of tens of thousands will have been deferred for another two years or lost forever. Let us all do our best to avoid that miserable end to our aspirations.

DR. MICHAEL ADAMS: At this stage perhaps we should highlight and try to draw some conclusions of the main points of the conference. It is obviously extremely difficult, but for me there have been three main themes. First, many institutes are hurrying to organize cooperative education programs, and in order to do this better they are checking to see how other people are organizing theirs. Second, there are very considerable possibilities for development in the area of international exchange. Third, and the area that I would like to concentrate on, is the possibility of extending philosophies of cooperative education into adult education for re-entry into the job market or back into the schools.

On the side of extending the ideas of cooperative education downwards, I would like to mention two European programs. Linked Education and Training, which I will call "alternance," was given the go-ahead by the Ministries for Labor and Social Affairs in 1979. The other, Transition from Education into Working Life, was given the go-ahead by Ministries for Education in 1976. This is an important point, particularly in a European context where the responsibility for education and training are in many countries quite separate.

But they both have in common the idea of breaking down the barriers between the education and training system on one side and employment, the labor market and employment services on the other. They are both concerned with the breaking down of the barriers between general education on the one side and vocational training on the other. They derive from concerns about the changes in participation in education and training, the changes in the labor market situation, the changes of skills which are needed to meet changing technologies, and they worry about the need for updating curricula and curricular content to meet these needs. While they are concerned with young people in general who are finding the transition difficult, there is a very definite emphasis on those who are likely to leave or who have actually left the education system at the age of 16, probably unqualified in many cases. And within that they are particularly concerned with the problems of equality of opportunity for girls, and the very considerable problems of migrants and of the handicapped.

"Alternance" provides some financial support through the European Social Fund for limited scale programs which create opportunities for young people to alternate education, training and work. The 1960s and 1970s saw a great expansion of the ideas of cooperative education, of sandwich education, within higher education. The same period also saw the growth of apprenticeship systems in which one can perhaps find the origins of much of the idea of combining education, training and employment. In some countries, however, the enrollment in apprenticeship programs started to decline and the number of apprenticeship places became limited. "Alternance" was an attempt to give apprenticeship a new standing, to argue that perhaps traditional apprenticeships needed changing. During the later '70s the "alternance" program revived apprenticeship as a method of linking education and training.

The other program, Transition from Education to Work in Life, is run by the Commission in Brussels. It is geared directly into the school systems, particularly the compulsory period of ages 12 to 16, and opens the curricula up to greater contact with the world around it. In some countries this is extremely difficult because the curriculum is very centralized and designed specifically to meet examination requirements. Discussion of this has therefore involved not just the schools where these changes have taken place, but also the government ministries. Since 1977 there have been 30 pilot projects running, and they are now coming to a close. The program itself is coming to a close in terms of its financial funding, and a report will be produced over the next year or two. The people who have organized this program would probably describe it as the largest single international program involving direct contact between the project leaders, the teachers from the schools, and the pupils concerned. While there are only 30 pilot projects, the actual number of people and locations involved is fairly considerable because some of these projects will have up to 20 or 30 actual locations in the countries concerned.

I think the developments from these two programs are a model, one that applies very specifically to the non-third level education and training for the 16 to 20 age group, and also to compulsory schooling, which in a European context has traditionally been much more rigid than the systems here in North America. It is a model for cooperative education which we can look forward to seeing in increasing use in Europe.

MR. BJÖRN GRUNEWALD: Not being an educator I can really feel a little bit amused about this classical situation that we here on the panel, like teachers, do all the talking and there is nothing left for you.

I am here as a representative both of the Swedish Employers' Confederation and also as the representative of the BIAC, the Business and Industry Advisory Committee to the OECD, which has a lot of educational activities as does TUAC, the Trade Union Advisory Committee, which is not represented here. I will try to be even briefer than the other speakers. It is very necessary that education on all levels develop a complete program of competence in the students. This competence has to be as an active knowledge, active skills, not merely the knowledge and the skills in themselves. This competence has three dimensions: the personal, the social, and the professional, and they must be balanced in order for the individual to function. The major imbalance in our societies lies in the lack of social competence, the ability to cooperate and coexist with other people, to respect them, their work, and the ways you have to work in business and industry.

We have two possible ways of looking at the needs not only of business and industry but of the whole of European society. One is the classical, static way which we have already reached in some areas, that of educating more people than there are positions that require that education. However, if you look at it from a dynamic point of view, the emergence of educated and skilled people is something of a growth/dynamic factor, something that can be used. Young people with a good education can do something, even if there is not a sufficient number of positions that traditionally require that type of education, and this is very important. Educated people can take initiatives, create business and other things.

I fully agree with other speakers in that cooperative education needs to be expanded upward to the adults and forward, perhaps, to the younger generations in primary and secondary educational levels. The OECD is holding a high-level conference on higher education this October, in Paris, where OECD countries will discuss the situation of the higher education system, access to higher education, and its manpower situation, because the number of teachers and people going into the public professions is already dropping very dramatically in many of our countries. In Germany, for example, about 60% of the university graduates have traditionally gone into teaching. This may be going down to 20 or 25%, so there is a vast number of persons in the pipelines who are now studying for professions and occupations that will not be their when they arrive at the end of the pipeline.

Let me briefly cite a few BIAC statements that we made in preparation for this conference. One is that at the time when all sectors of the economy must face up to structural adjustments, education should try to perceive the results of economic and social change, and orientate the contents and organization of their education programs to them. New thought should be given to the important factors that condition the transition from school to work and the integration of young people in the private economy. While education is faced with the problem of adaptation, the industrial employers and private sector are faced with two problems: the redefinition of jobs according to the qualifications of the graduates, and a reorganization connected with the general rise in educational standards. However, these higher skills are not only to be found at the medium or higher levels of a firm or service. It is therefore extremely difficult to predict in an overall or systematic manner changes in occupational structures.

In conclusion, we have to develop an improved dialogue and consultation in order to define the policy and orientation of education, to seek solutions and to take practical steps. This applies to official bodies, higher education establishments, and trade circles. An active, external relations policy has already made it possible and will make it possible in the future to achieve useful forms of cooperation in the educational field.

LATIN AMERICAN REGIONAL SESSION

Dr. Bianca de Torres
Director General, National Institute of Work Studies
Mexico

Mr. Heitor de Souza
Vice President, Federal Council of Education
Brazil

Mr. Juan Celanda
Technical Vice President, Alpha Group Steel Division
Mexico

Dr. Mauricio Herman
Social Development Division, Inter-American Development Bank
Peru

DR. BIANCA DE TORRES: I would like to describe to you some of the Mexican strategies for training human resources, but before I do so let me give you an overview of how Mexico sees itself today.

Modern-day Mexico's situation has very special features which distinguish it from the majority of developing countries. In fact, at a time when there is a recession in most parts of the world and prospects of a lower degree of development in the near future, Mexico has a growth rate of over 8%, and a similar rate is predicted for the coming years. The country's major energy resources are expected to bring favorable prices and allow for a search for more independent socio-economic development based on national interests. The great challenge will consist of achieving development with adjustment so that our own Mexicans will have access to the new well-being generated in the future.

The growth rate of our population is still high, although in 1980 it came down from 3.6% per year to 2.9%, which is already an improvement. 65% of all Mexicans are under twenty-four years of age, and 43% are under fourteen. Of a total of 21.7 million persons enrolled in the educational system, 15 million are presently attenting primary schools. 20 million adult Mexicans did not finish primary school education and require the same opportunities as those offered to the children. The average educational level for workers in 1970 was 3.6 years. At that time, 27% of the individuals forming part of the labor force had no schooling, 60% had between one and six years of education, and only 13% had more than six years.

The breakdown of the gross domestic product reveals that Mexico's development has been uneven. In fact, the industrial sector's share of the gross domestic product is 39%, agriculture's sector produces only 9%, whereas the sector devoted to trade and services totals 52%. Other aspects of this problem include notable differences in productivity among the various productive sectors. The agriculture sector employs 26% of the labor force and produces less than 10% of the gross domestic product, whereas the petroleum industry employs less than .5% of the workforce and generates almost 6%. The productivity ratio for these sectors is 1 to 30.

In 1980 the gross domestic product rose to $167 billion dollars, resulting in a per capita income of $2,400. Nevertheless, the distribution of that income shows very sharp differences, and has led the Mexican government to plan a new strategy for development. We have now what we call the global plan for development, which entails a considerable effort to achieve an appropriate orientation of resources and a fulfillment of specific goals. Furthermore, it indicates that Mexico will be growing at yearly rates of no less than 10.8% between 1980 and 1992, which is quite opposite to the last report presented by the Treasury Department of the United States. This includes a 10% annual growth rate for the manufacturing industry, 11.1% for construction, 13.1% for energy and 8% for the production of basic consumer goods. Prospects for the future include an annual employment growth rate of no less than 4.2% of available positions, which means the creation of no less than 700,000 jobs for the year 1981. The achievement of this goal should cut back open unemployment to 5.5% by 1982. The essential strategies of the employment plan are the rationalization of labor supply and demand by means of suitable information.

As I mentioned before, we have strategies now too for the development of human resources. These are based on the urgent need to fill jobs that are being created by the country's ambitious development program. This training of human resources is being met initially through the expansion of agencies in charge of this task at different levels, and mainly by means of budgetary increments and improvements in education and training. In 1979, through an advisory committee on employment and productivity which is comprised of most of the ministries in the Mexican government, a technical committee of human resources planning was established jointly by the Ministry of Labor and the Ministry of Education. The main objective of this committee is to help define and guide policies in the fields of education, training and skill development in the projected period of 1981-2000. Specific actions now being undertaken by the Mexican government include improving the educational system at the base, that is to say reforming the initial education programs to include some of the things we have been calling for in this conference, and linking terminal education to the productive system. In 1978, enrollments in terminal technical courses totalled 35,000 students, whereas in 1980 that figure had risen to over 50,000. This commits the government to new enrollment goals for 1982. The main effort is being directed towards seeing that training is carried out under the supervision of the companies themselves, which draw up their own programs and provide the training at the work place or in the classroom. We also have cooperative programs for administrative and managerial training.

In conclusion, let me suggest a strategy for countries that are facing rapid change and rapid development in society as well as in economic growth. Development depends upon a continuous process of investment leading to a high, sustained and efficient growth of the domestic product; upon the ability of society to make effective use of all the human and financial resources available to it; and upon the effectiveness of society in distributing these benefits of production on a just and equitable basis. In Mexico, this global plan for development offers a strategy that links economic growth to the promotion of employment, education, training and increased productivity.

MR. HEITOR DE SOUZA: As Mrs. Williams pointed out, the society is criticizing education, the educators are criticizing education, in short everyone is critical of the system. She mentioned two problems that are particularly pertinent to our discussion here--the quality of education and its relevance. She did not, however, mention quantity, which is also a big problem because the system has grown a great deal in the last few years. This quantity has affected quality and also relevance, since our educational system is producing young people who are not well trained for the market and not easily accepted by it. How can we improve them? Cooperative education, I think, is one way of solving the problem.

In Brazil we have not done much in the strict sense of the cooperative system. Our most prevalent type of cooperative education is what we call internship. These internships are very light, and students sometimes start them during the school vacation. They are most often in the areas of technology and teacher training and are not available in all fields of study. The internship can last anywhere from 30 hours during a semester or sometimes a year to normally 360 hours in an engineering curriculum. This is required, and a maximum of 10% of the credit hours in an engineering curriculum today can be satisfied by this cooperative work experience. Since in Brazil a lot of industrial enterprises belong to the government, students can get government experience too. We also have short-term specialized, professional internships which people do when they are in the last years of their curriculum.

Internship is one form of cooperative education, within the undergraduate spectrum and within the curriculum, and it is now compulsory in engineering and business. Previously we hired engineers who had never been on the job. The first engineers to take the new engineering curriculum will graduate next year, so it is too early yet to judge whether we had any success with the problem or not.

There is another kind of cooperative program in Brazil, very small and limited to about four institutions. It also started in our new era of engineering, and is more similar to the cooperative system you have here at Northeastern. We had the problem of showing to industry the kind of engineering we were putting out on the market. It was materials engineering, which is something new in our country. It took some time for industry to understand this new profession, but it was very advantageous for a university starting a new curriculum to learn what kind of adjustments it should make in the curriculum based on job needs and requirements.

The program started with small numbers of students, half of whom would be one full semester in school while the other half would be at work. Some received no pay, some received the minimum wage in Brazil, some received food, lodging, and so on. The beginning was very difficult, as the director had to promote the program to the people from industry. But pretty soon we got, and still have, more offers for student placements than we have students to place. So this aspect of cooperative education is working well in Brazil.

There is another aspect that I should mention here which is also relatively new, in fact only five years old. It is a new law under the supervision of the Ministry of Labor which provides tax incentives to train people from industry either within the university, in special courses within industry, or in cooperative programs. This interaction between industry and the universities is relatively new, and I think that we can expect some advantages from it because it will provide the funds which are usually one of the bottlenecks of these cooperative programs.

I would like to call your attention to three trends in this growing collaboration between university and industry in Brazil. First, our more recent university reform law of 1968 shapes the public system of education and gives some freedom to private systems. However, we have not yet fully implemented this reform law in education.

Second, the enterprises in Brazil were facing rapid growth and thought that universities were too traditional and not producing what enterprise wanted. They therefore started their own training centers. This began as a program of human resources development and personnel improvement, but some of these centers are now almost full-fledged universities.

Finally, some centers outside the university combine teaching and research. This is a trend which I do not favor because if they do this they are going to weaken the universities. The cooperative system should be used instead.

There is still a lack of coordination in solving our overall problem. The council of which I am vice president deals with this matter. But it is not a simple matter because it involves more than the educational spectrum. It involves the whole socio-economic environment. Education can be blamed for many things, but we must remember that it is itself embedded within a larger system. Even the more developed countries have a similar problem. So in developing countries such as Brazil, in which everything has priority from illiteracy to graduate studies and where education is now facing a very serious crisis, we as educators have to be aware of what is going on in the society as a whole in order to solve our problem.

MR. JUAN CELANDA: There is in Mexico a great interest in the expansion of industry/university collaboration in the development of human resources. The principal modes of this collaboration can be classified as either unilateral or bilateral. The unilateral mode is characterized by the support of the university on the part of industry or vice versa, but does not include participation of both parties in the design or implementation of the activity. The bilateral mode is characterized by the joint participation of the university and industry in the design and implementation of collaborative activities in human resources development.

I will go through five models that are in use in the unilateral mode and list the main activities that have been implemented.

(a) Advice on the part of industry in relation to the curricular content. The objective sought with this advice is a better definition of the abilities desired by industry in a university graduate at the time he received his diploma.

(b) Industrial personnel participating as part-time professors. The objective sought is an improved coverage in courses that require a deep professional experience, such as chemical plant design and construction workshops on architecture. These benefit considerably by bringing to the university the practical experience of industry personnel. Furthermore, those part-time professors for training programs given to full-time faculty participate in workshops such as specific learning objectives, microteaching and student evaluation procedures.

(c) Continuing education courses. These courses intended to offset obsolescence are quite common throughout the continent; nevertheless the demand for these services in the fields of technology and science is small in Mexico. The promotion of many employees with technical or scientific training to management positions within the industry has created considerable demand for management courses and seminars. The professionals who are promoted or who are candidates for such promotions find that continuous education programs are a practical way to acquire the additional skills and abilities needed to perform their new duties.

(d) Professional services for industry. Under this heading comes a series of studies and projects that the university performs at specific industry request. These services may include research and development projects, consulting work, laboratory tests, marketing studies and so forth. The work is done by professors with the aid of students. All parties involved--industry, university, professors and students--benefit on several counts from this cooperation model. The benefit to the university may not be as clear in wealthy communities as it is in Mexico. The university in Mexico has considerable trouble holding down the turnover of its good professors, who are attracted by better paying industrial positions. Because the university does not offer particularly high salaries it must have other incentives to make the professor's job more attractive. The opportunity to do technological research and solve selective industry problems contributes to giving the professor's job added challenge and a favorable avenue for advancement and recognition.

(e) At the request of the university, industry admits students on a temporary basis particularly during the summer vacation months. Each student is placed under an experienced professional as his aid or apprentice. He is assigned real industrial problems and is tutored as required. A performance evaluation is made at the end of the practice period. The students experience a real environment of professional practice in problem definition; the gathering and analysis of data; the generation and evaluation of alternatives; the preparation, presentation and discussion of reports; industrial discipline and working for a salary.

I will now give four examples of what is being done in the bilateral mode in Mexico. The need for improvement of cooperation between industry and university is widely recognized, and at present nearly all institutions are trying to meet these needs to some extent through activities such as the ones already presented. To provide a wider scope on the development of satisfactory cooperation, industry and university jointly design and implement activities such as those following:

(a) Practice schools. This is a teaching method whereby one or two professors from the university tutor a group of students who are interns in a particular industry for six weeks, eight hours a day, in the months of June and July. They define, study and solve problems that have previously been identified and that are of common interest to industry and to the group of students and professors. The participation of industry is through the joint selection of problems, the naming of an advisor in its behalf and the bearing of the cost of services on a contractual basis.

(b) Industrial graduate program. Under this program the university offers to a group of employees of a particular industry a Master's-level program that includes two types of courses. Some courses are specialties offered by the universities, such as chemical engineering, business administration and operations research. Others are specifically oriented toward the interests of that industry and specially designed for it. This type of program is aimed at the acquisition by industrial personnel of specific abilities within the area of specialization and general ones useful within that industry. The industry and the university jointly plan the program.

(c) Researchers' training in the industry. The development of human resources in research is a problem that has been tackled through different models. This program establishes a team made up of a competent researcher from industry of from the university, and assistant professors and research assistants both from industry and the university who maintain a lasting working relationship aimed at developing themselves as industrial or university researchers. This group works on specific projects that both industry and the university jointly select.

(d) The development of entrepreneurs. One of the most important needs in developing countries is that for entrepreneurs capable of creating and managing entreprises. In Mexico a special program for the development of entrepreneurs has been started, the objective of which is to discover, motivate and develop the abilities of would-be entrepreneurs through the following stages: (1) A Master's program in business administration. (2) An entrepreneur workshop that involves the students directly in the creation, implementation and operation of a real enterprise. Once the operation is successful, the enterprise's stock is sold on the open market with options given to professors and students. (3) Feasibility of several possible enterprises is continuously under study. The university designs and controls a Master's program. The enterprise is created and administered jointly by the university and a group of experienced entrepreneurs.

In conclusion, we can say that the experiences in some areas of Mexico are those of a real collaborative effort between both the university and industry that has resulted in considerable benefit in the effective development of human resources.

DR. MAURICIO HERMAN: First let me mention that we have had cooperative education components in some of the loans that the Inter-American Development Bank has made.

I would like particularly to single out Panama, Costa Rica and Argentina as countries where our loans were devoted to financing educational projects that did have a component of cooperative education. Let me now just share with you four basic ideas pertaining to cooperative education in Latin America.

First, there seems to be a shifting emphasis among international financial organizations away from university financing and toward the increased financing of lower levels of the educational pyramid. We now submit loan requests for education projects to a multi-disciplinary analysis, and it is the economic aspect of this analysis that I would like to call to your attention. The three basic criteria used by economists in analyzing educational projects are: (1) social demand, (2) internal efficiency, and (3) external efficiency. By internal efficiency we mean the cost per graduate, how effective the educational machinery is. By external efficiency we mean the demand for those graduates in the workplace. These two points are intimately related to the cooperative education approach which, by increasing the student's motivation and desire to learn, is probably able to increase his marketability.

Second, all of the presentations in this Second World Conference have implied that cooperative education is practically restricted to higher education. Since cooperative education is the integration of the classroom and the workplace, and since education takes place not only in the classroom, why not think in terms of cooperative education at the secondary or even at the primary school level?

This leads to my third idea, expanding the concept of cooperative education to encompass not only the school/job integration but the school/work integration. Notice that I make a distinction between job and work. Productive work and employment are separate concepts; the function of producing is not only performed by job holders who earn a wage or a salary. The unemployment problems which are becoming such a serious concern to developed countries have been with us in the underdeveloped countries for many years, and education should enable the men and women receiving it to perform productive work and thus generate income rather than only find a job. If we approach cooperative education this way, then we can easily apply that concept not only at the very top of the educational pyramid, but at the secondary and perhaps even at the primary level as well.

Finally, in this decade in which we are facing the serious problem of allocation of scarce resources, we must find cost effective ways of financing education in underdeveloped countries. We all benefit from education, so consequently we must all share in the responsibility of providing for it, and we cannot fall into the trap of duplicating capital investments. If, for instance, industry has installations that can be placed at the service of the universities, we should use them. Furthermore, because statistics prove that there is a very high correlation between the level of education and the level of income, and since the student is a beneficiary, he must also contribute. The responsibility of the family too is to provide education for its children, not an accumulation of material goods. It is also the responsibility of government, as a manifestation of organized society. It is a human right that the masses receive an education.

MIDDLE EASTERN REGIONAL SESSION

Mr. Amer Ali Omeir
Ministry of Education
Oman

Dr. Khedaire S. Al-Khedaire
University of Petroleum and Minerals
Saudi Arabia

Ms. Asia Habash
Ramallah Women's Teaching Center
Jerusalem

MR. AMER ALI OMEIR: Our educational experience is very short indeed. We started from scratch in 1970, but in ten years we have been able to make a lot of progress. As a matter of fact, we have been able to provide primary, intermediate and secondary schools in many parts of the country. We have also been able to provide girls' education, which was absolutely non-existent before, and we are now starting to provide facilities for the training of teachers.

As far as technological education is concerned, even at this very early stage in our educational development we have tried to formulate a policy of diversification of education at the secondary level, and we hope that by introducing this policy of diversification we will be able to include in our educational system technological, agricultural and commercial education and teacher training. This is very important to Oman because it will answer a lot of our needs.

Some people believe that there is not much difference between education and training, but I think that this is something we have to go into fairly seriously because as far as we are concerned in developing countries, a belief like that could lead not only to quite a lot of misunderstanding but to the destruction perhaps of the educational system.

I would like to point out first of all that in our efforts to determine strategies for coordinating education and work we must not lose sight of the general role of education in society and allow the pendulum to swing to one extreme. This would be dangerous because in developing countries education has many other important roles to play apart from training. For one thing, it will help us achieve employment mobility and meet the human resource needs of society. Education will also help to develop responsible individuals with a sense of values, and here we have to draw a line between education and training. Training is absolutely necessary, but it should not take the place of education. Each has its own important role to play.

In developing countries this role is of particular importance since our young generation has to be equipped not only with skills but also with values and an outlook that will enable it to meet the challenges of a changing society without losing its identity and its heritage. This is where education as education has a greater role to play than training.

Secondly, our developing countries in the Middle East have natural resources which in some cases have not been tapped or economically exploited. In order to exploit them we need a technological infrastructure like the kind that has long been established and almost taken for granted in a majority of developed countries. In an effort to build this, we are leaning heavily on the developed countries for manpower, know-how, and materials. At the Belgrade Conference, UNESCO recommended that support be given to member states' efforts to increase the importance of science and technology in education, particularly in developing countries. The Conference also recommended that education and productive work be linked.

These were very relevant recommendations as far as the Middle East is concerned. But herein lies the vicious circle that presents problems for us in implementing educational programs to develop our human and economic resources. It is quite common in our part of the Middle East, and perhaps is also common in a number of other developing countries, that a stigma is attached to any kind of manual work. Most of the parents, and of course most of the younger people themselves, usually aspire to an academic type of education and their interest in non-academic education is very limited indeed. Now if we are to develop a system whereby education can play a part in developing non-academic, technical education, then we have to think very seriously about how we can combat this idea in the minds of not only the young people themselves but even of the adults and the society as a whole. People feel that it is degrading to work with their hands, and our educational system perpetuates this idea by glorifying the academic type of education at the expense of the non-academic type. What incentives can we provide young people in order to interest them in, for instance, technical or agricultural education?

This is a problem which cannot be solved very easily. One of the main reasons is that in most of our countries we do not have industries to help influence change. In the developed countries industry plays an important role in providing facilities for technical education and for the transfer of technology. The non-existence of industries in our part of the world hinders the development of technology and technical education. But in order for industry to develop, the society must be receptive to the education necessary to maintain it.

DR. KHEDAIRE S. AL-KHEDAIRE: The cooperative program at the University of Petroleum and Minerals has existed since the University was inaugurated, and the University has been deeply committed to it ever since. This program is geared mainly towards our engineering students, but it also provides training for students in the area of business, because in addition to engineering, which the University of Petroleum is known for, we have a College of Industrial Management.

The concept of the cooperative program at the University of Petroleum and Minerals, although it sounds similar to that of the cooperative education programs in the American universities, differs a little bit in its application. The cooperative program here does not just give students a chance to experience on-the-job work training or provide them with monetary help. The cooperative program is part of the academic preparation of the students, who are required to go for training in order to complete prerequisites for graduation.

Students must be in the university for three years in addition to one year of orientation when they first come, so the cooperative program is started after the fourth year. Students are then required to go for twenty-eight weeks of cooperative training. They leave the university, have no contact with academic classrooms, and are employed by a company in their field. The arrangement of placing students is taken care of by the cooperative program office and is greatly supported by the university. The students admitted cannot graduate unless they meet the requirements. Students can either remain in the kingdom for training or go outside, whichever they prefer, because some students have no desire to go abroad either for personal reasons or because they have social obligations toward their family. Then, since it is part of the academic preparation and the students cannot graduate without it, we require the company to provide us with evaluations of what the students did during training. In addition, when the students come back to us, we ask them to write their own evaluation of their training experience. Upon completion of the program and the evaluation, the students are entitled to nine credit hours.

Many students from other developing countries who go abroad wind up staying in the United States, but Saudi Arabia does not suffer from this problem at all since it has become the land of opportunity for its nationals. Students come back home when they finish, whether they are on the scholarship program that Saudi Arabia provides or in the cooperative program. Furthermore, because our programs start at the end of the junior year, students have to come back to finish their requirements.

The international program that the university has is really diversified. We send students to a variety of countries in Europe, especially Western Europe.

We have our students in Asia, Taiwan, Japan, and we are opening new avenues in Australia, Canada and the United States.

The cooperative education program has three main objectives. The first is to provide the student with exposure to the real business world. The second is to give the student a chance to discover whether his field is really appropriate for him, whether he is going in the right direction in his academic preparation. Does a civil engineering major fit his ability? The student experiences civil engineering for a while and he may come back deciding not to pursue that career because he has found that it is not for him. This occurs more with business students than with engineering students. The third objective is to give the student an exposure to outside culture. Certainly students sent abroad have some difficulties in social adjustment. This is expected and is part of the program. Students in non-English speaking countries such as France or Germany also have minor difficulties, since these countries require language preparation even if the company's personnel speak English. This is to the student's advantage, not only as preparation for his career but as simple language experience. Students come back to Saudi Arabia with an appreciation for both their own culture and for the host culture, and this is very important. You cannot really know your own culture unless you have been exposed to a different one in order to make a comparison. This is a very positive feature of the program at the University of Petroleum.

We have no problem in placing our students. We have many foreign as well as national companies that really want our students either for the cooperative experience or permanently after graduation. This is, in fact, another function of the program to provide a pool from which Saudi national companies suffering from a shortage of human resources can recruit new employees. Indeed, a number of companies have very positive experiences in that those students who spent their cooperative experience with the companies end up working for them after graduation.

MS. ASIA HABASH: Young Palestinian men and women look to education as their salvation for the future. Education is a very important aspect of the struggle for life and a better future for their children.

The idea that working with your hands is rather degrading has been instilled by the colonial regimes that ruled the Arab world and the Middle East in general. It was during the period of independence of most Middle Eastern countries that this attitude was entrenched in our education and in our habits. It is taking educators in the Middle East a very, very long time to change this attitude and to turn our education and our training in a more technically oriented direction.

As a starting point in this respect, UNRWA, the United Nations Relief and Work Agency for Palestinian refugees, with the help of UNESCO found that technical and vocational education is a very important aspect in the training of young Palestinian refugees. So several training centers were established in the various host countries of Palestinian refugees to train young men and women in different vocations. Our institute has a very traditional program for teacher training for women, but I would like to dwell on the technical education that is offered to young women in our area.

Foreigners have often thought that education was not very desirable for Moslem women in general, and for traditional and historical reasons women's education in the Middle East has been suppressed. Fortunately we are now seeing a revival in the education of women in the Middle East, whether that education be academic, technical or vocational.

In general, the United Nations organizations that I work for saw that technical education has the important purpose of equipping young Palestinian men and women with work skills for the future. Most of the technical colleges that were established in the early 1950s and 1960s were therefore geared towards cooperative education. This meant that a student had to go through a job training period in an institution, office, factory or small industry in the area. The length of job training varied from college to college and from specialization to specialization. But in general, the aim of the job training at that time had the double purpose of introducing the graduates of the colleges to the community, and giving the students a real feeling of what it was like to be working in a factory, industry or an office.

As a result of this kind of training, the UNRWA training centers are very popular on the West Bank, in Jordan, Syria, Lebanon and the Gulf area. Their reputation is very good for producing highly specialized technocrats, which brings me to another point. There is a lack of middlemen in the Middle East. We have the highly specialized engineers, doctors and agricultural engineers whose skills are very much needed in the area. But for a very long time we did not have the people to assist them. These colleges established by UNRWA trained technocrats in the areas of paramedical aid, engineering and agriculture, thus filling the gap that was there at the time.

Today, because of the lack of industry in the area and because of the tradition for women in terms of jobs and education, jobs that are technical specializations are still offered to men. But women are now encouraged to enroll in courses leading to jobs as paramedics, laboratory technicians, assistant pharmacists, nurses, x-ray and dental technicians, assistant nutrition technicians, secretaries, clerk typists, assistant hairdressers and assistant cosmetologists.

This job training, which is cooperative training, is entrenched in the tradition of teacher training. All over the world cooperative education is part and parcel of teacher training.

MR. OMEIR: Education, if we take it in its real meaning, covers far more than just training. There are other elements in education which are not related to training in skills, and skills in themselves are only a part of training. There is a lot of character training in education. For example, there was a time when we used to believe that education had to cater to the cultural, the spiritual, and the social, as well as the individual aspect of the student himself. You are educating a young person who has perhaps a number of qualities in him which need to be unfolded and need the opportunities which allow this to happen. Now this is quite different from just training a person in a certain number of skills. I think we in the East have tended to glorify the letters too much. We like our poetry and our language. This is beautiful, it is a part of our life, but in the modern age our education should cater to more than the literary aspect of our life. Hence the question of technology creeps in. This is a world of technology and we cannot exclude ourselves from it. We have to take part in it, and that is why we are interested in acquiring technology. We are interested in sharing the advances made in technology in the world as a whole. This means that our education has to change from an entirely literary type of education to an education which has a wider scope without, of course, losing what we have already developed so far by way of literature and language.

DR. AL-KHEDAIRE: There are two types of education: education for life and education for living. It is deeply rooted in the Islamic tradition to teach your children swimming, horseback riding and shooting. In case of an emergency you know how to swim, how to shoot and how to escape. This is education for life. Education for living is going to school and learning some trade, some profession. In respect to the latter type of education, we are living in the past, in the traditional educational philosophy of the Moslem world in which education used to be for a good life, to beautify your soul and to become intellectual. There were good leaders in education, poor but highly respected socially. But things are changing. People today put more emphasis on material gain through education than on the social status attached to it.

When I was conducting my research in the United States on our students' reception of American culture they asked the questions: What is the function of education in American society? Is it for a good life? Is it for material gain? Is it necessary? Is it an evil that you have to accept? All of them said that education was for a good life. They believed that real education was to beautify your soul and enlighten yourself. My committee was astonished by this, but this was the way we looked at it, the traditional way. Now things are changing. Students are going into engineering, and this is certainly not to beautify yourself, but to gain monetary rewards.

MS. HABASH: I cannot separate class and training or education and training. Education is a very broad area of our lives, and I think that training is part and parcel of it. Whether it is manual or mental training, it is part of the spiritual aspect of education. From a very general point of view our culture is a very literary one. Most of our literature comes from Saudi Arabia, where until recently the people did not have anything to do except ride horses, speak beautiful poetry and listen to each other sing. Our language is very beautiful and eloquent. One can express oneself in Arabic in several ways, using several meanings. The idea that training itself is spiritual is entrenched in our religion. This had broad implications for education. Education was at that time religion, and even now with modernization it still encompasses all kinds of training, mental or manual.

SPEAKER FROM EMBASSY OF UNITED IMMIGRANTS IN WASHINGTON: I have a question for Professor Al-Khedaire. You mentioned that Saudi Arabia does not experience the problem where most of your students do not return home. As you know, some other developing countries face this problem. So if you were asked to advise these countries on how to overcome this problem, what would you tell them to do?

DR. AL-KHEDAIRE: A sense of nationalism must be created so that these people feel attached to their countries. If you cannot provide a lot of material gain for them or a chance to experience at least the same standard of living that they were used to while they were students, you can compensate for this by fostering a sense of attachment to the country which they can experience when they return.

SPEAKER FROM AUDIENCE: I think that whether they are students or immigrants, this movement of qualified people is a natural response to natural market forces. People go where there is equity. They do not stay for non-equities. Unless you place restrictions on their movement you cannot escape this. Perhaps through education, nationalism can be fostered, or perhaps a feeling of service to the country, some feeling of responsibility to the motherland. But ultimately the natural market forces will govern.

I would like to discuss one of yesterday's points. One of our colleagues mentioned that people who go into the trades or into the vocations are the ones who do not do well in school. This is a stigmatizing approach. Perhaps ultimately this is what happens, but we should try to destigmatize the vocations by not saying that less intelligent students will go there while the better ones will go to universities.

Another point I would like to make is that we have a government requirement in Arabia. All transnationals must be involved in human resource development. Every contract has a clause requiring this. I think this will help, because if every company has to train then every company will push agencies to give them candidates. Consequently our outlook towards vocations will change. I suggest that perhaps we should encourage the vocational training to start in high school and even before that. Because of the extensive development taking place there is a chance for us, from a cultural and from a cooperative education point of view.

SPEAKER FROM AUDIENCE: I have another question for Professor Al-Khedaire. You mentioned also that it is the desire of the student himself to be sent outside for training. Do you have a strict policy whereby the student should meet certain standards in order to be sent outside?

DR. AL-KHEDAIRE: We have a standard according to which we send a student to co-op who has a 2.0 average (C average) in his major. If he is under this we will not accept him for co-op until he improves his academic standing. Some good students, honor students, stay home however because of social obligations toward their families. We do not push anyone to go abroad.

NORTH AMERICAN REGIONAL SESSION

Dr. James Wilson
Director, Cooperative Education Research
Northeastern University
United States

Ms. Sandra Kuntz
International Paper Foundation
United States

Mr. Larry Wagg
Director, Educational Services of the
Canadian Labor Congress
Canada

Mr. Gil K. Richter
General Electric Company
United States

DR. JAMES WILSON: A couple of important notions that have come from the deliberations of the last several days in terms of the broad theme of human resource development worldwide are that we have, in essence, two very great institutions in our societies. On the one hand we have education as an institution whose mission it is to work with its citizenry to prepare them for participation in their societies. They are the resource about which we have been talking. And we have a second institution, the workplace, for the production and distribution of goods and services throughout the society. I think that many of us sometimes have the feeling that these two institutions run along side by side and only occasionally, sporadically and in somewhat unplanned fashion ever interact. It was Willard Wirtz in his boundless energy who suggested that we are really two elements of a single world, and that somehow when we function the way we sometimes do, the total is less than the sum of the two parts, and that perhaps there are ways by which we can do better. Our theme here is to find ways by which we can interact, by which we can make real linkages.

I'm not sure of all the specific techniques that can be developed. I'm not sure of the full process by which these occur, but I would suggest that there is at least a functional process that we must go through if indeed we are to achieve the collaboration between these two great institutions. First of all we have to know ourselves, we in education and the people in the workplace, to understand our needs, our problems, to better define our own goals and our objectives, and when we do that we will discover that there are common elements between these two institutions. We heard this morning from Mr. Willis that one corporation in this country spent 1.2 billion dollars for education. That is even greater than Harvard in terms of a budget. This is an amazing and enormous amount of money for one corporation to spend on education. Mr. Willis was suggesting that possibly we're developing parallel systems, and that this might be a great tragedy because it would be wasteful. It seems to me that we have to recognize that we have needs and problems, but that we also have resources outside ourselves to help us in meeting our needs.

For example, the essential function of education is to educate the citizenry, to help them become a part of their society. The essential function of the workplace is to produce. The workplace needs the products of our educational institutions, so we are irrevocably interrelated. As industry looks at its recruitment needs and makes clear the kinds of needs it has for talent, there has to be a relationship back to the institution, because our curricula cannot be developed without some cognizance of the needs of the society gained through this kind of interaction. This theme can be carried on throughout the whole notion of the recruitment of new talent, of the upgrading and the revitalization of existing talent, and of other forms of collaboration. For example, it used to be that the great research in our country was done in the universities. That is no longer the case, and yet in our universities the means by which one advances in one's own profession is that one must do research and publish. Often the result is that people are doing research that is not very good research, because they do not know how to do it and they do not have the facilities. It seems to me there may be some basis for collaboration in this area. There are needs for our adult learners, and it seems to me that there is again a basis for a very strong collaboration.

I do not know the precise techniques, but I do know that it must start by somebody reaching out to somebody else, and I do not care who is first. It seems to me that there has to be a getting together, and that we do have one formal mechanism in this society, in all our societies actually, which brought us together here. We have the notion of cooperative education, which is a formal link of putting our young people into the workplace while they are still students and while they are learning. In America and in Canada there are now approximately 1,050 programs of cooperative education, of this formal linkage between the workplace and the educational institution. It seems to me that this is a point by which we can extend the relationship and the collaboration to all other avenues of possible interaction. Thank you.

MS. SANDRA KUNTZ: From the perspective of one corporation which has attempted by virtue of its contributions program to develop linkages to the people in its communities and to the educational institutions, I am going to describe our program of aid to public schools in our mill towns. We are rather unique among corporate foundations in that we have a program of this nature rather than one of support to colleges and universities. We believed in 1952 and 1953, when these ideas were being discussed, that the most important contribution we could make to these small out-of-the-way rural towns in the northeast and southeast where we located our mills, was to help improve the educational system. We had two self-interest motives here, and in our business that is called enlightened self-interest. The first was that we felt that a great number of people who were in that educational system might eventually end up in our mills, and improving the system would eventually have a direct benefit on the company. The second was that improving the educational system in those communities would probably make them more attractive to managers when we moved them around.

Those two ideas are still very important twenty-five years later, but we have become more mature and sophisticated in how we think we can help the schools improve teaching and learning. We now believe that the use of community resources, either in identifying the problem critical to teaching or learning, is essential, and we instruct through our guidelines and policy statements all of the teachers and staff to look to what is happening in their communities and to design programs which meet those needs that will surface later on. Community resources should be used whenever possible and efficient to implement the program.

As a result of our thrust in this direction, the Education and Community Resources Program involves parents in a volunteer effort in working with teachers and students in the schools. Parents and others from the community help youngsters understand career choices at all grade levels, and economic education is used in grades K through 12. Our people in those communities are much more readily available and involved in what the schools are doing. We also have a communicator in every one of those mills and a group communicator where I work in New York, and I am in touch with them. We have just reviewed the school projects for the next school year, and have sent out letters to help provide technical assistance in the community. We spend half a million dollars in the foundation doing this.

I would not be here unless I felt very strongly that cooperative education was extremely important and had benefits for both sides. But I do want to caution all of us here that corporations are experiencing an enormous social pressure. Everyone knows that we are in the giving business and there is a great pressure to do much more at the community level. In the last five years alone the amount of money to the arts given by business has seen a staggering increase. We are now being asked to help communities that have drug, alcohol and substance abuse problems, and teenage pregnancy problems. Obviously we are the biggest operation in town, we employ the most people, pay the taxes, and are very visible. So we feel a responsibility. However, I think that we must realize that the corporations in this country, while they could be doing more, cannot do it all, or cannot be the ones called upon whenever there is a social dislocation or crisis. I think the case has to be made very cogently on a quid pro quo basis, "What's in it for the corporation?" I think it is very obvious. We all recognize the values to young people, their improved employability, their potential mobility, their motivation, their work habits and skills. We must persuade the corporations who are not involved and who should be and could be that they have something to gain as well.

MR. LARRY WAGG: Our involvement with cooperative education in the Congress is a close one since we have employed five or six cooperative education students from the liberal arts. From an employer's standpoint we are quite satisfied with this approach.

As trade unionists representing the employees of companies in public sector unions, we want to be very sure that any programs that we endorse will be for the benefit of the people that they are aimed at. I am sure that most of you involved in cooperative education have heard from trade unions and their concerns about whether someone is being exploited or not exploited. In any case, until we have the type of consultation that lets us be respected, we are not likely to go too far in any cooperative arrangement.

I want to briefly tie in where I think recurrent education fits in with cooperative education, and I do not see them as parallel systems. Paid educational leave is the basis for that recurrent education. We in Canada and the Canadian Labor Congress have adopted a policy on paid educational leave which we define as "leave granted to a worker for educational purposes for a specified period during normal working hours and without loss of earnings or other benefits." I must stress here that our definition of paid educational leave includes all education, and essentially we endorse the International Labor Organization Convention of 1974. I might add that the Canadian employers did not endorse that convention, so we have been pretty lonely in promoting paid educational leave, and with some varying fine exceptions we have not had too much success in encouraging our friends from the post-secondary institutions to join with us in this integral part of manpower policy and training. We have been promoting it at the legislative and collective bargaining levels, however. As a brief example, since the first paid educational leave contract was negotiated for trade union education by the auto workers, the UAW in Canada now has over 200 contracts with paid educational leave clauses. Also, our Government Employees of British Columbia contract has a paid educational leave clause that includes all forms of education.

Now it seems to me that recurrent education is really cooperative education in reverse, in that we are talking about the right of people who are already in the workforce to go back into academic or other educational institutions for further training. We were very surprised by the attitude of the employers, because we thought we would have success with them when it came to vocational training or training that could be argued helped a person to better do their job. However, it has not proven successful.

I would like at this point to pose a few questions. Where does cooperative education fit into the recurrent education approach? Does the present system of cooperative education only work for the higher educated? Shouldn't the principle and philosophy of cooperative education apply for all workers?

In Canada there is now mutual cooperation between the employer and the union in joint apprenticeship committees. We don't have to encourage young people to go into apprenticeship; they are lined up for them. We just don't have the facility to bring that about. The status of apprenticeships is not at the same high level as in Europe, but I suggest that when you hear about Germany or Switzerland with their extensive apprenticeship programs, perhaps you can extend that into the future and envision a different type of education to fit new jobs, some of which we are not even aware of, nor do they now exist.

MR. GIL RICHTER: It is a very distinct pleasure to meet and talk with you this morning as a representative from the General Electric Company in the greater Lynn/Boston area. The scope of our educational activities touches on virtually every frame of reference that you could conceive. We conduct at our major locations a wide range of educational and training programs that include such elementary activities as shop mathematics, blueprint reading, equivalency high school degree programs, and technical programs designed to develop people who have the skills to meet the technical skill jobs. We are also involved with the local secondary school systems at many locations, particularly when we reach a point where we have mortgaged all of our training facilities and need to supplement what we have. We have too a wide range of apprenticeship training programs, our own training institutions of a university equivalent nature, a very wide-spread tuition refund arrangement which is directed primarily at our management professionals, and also negotiated contractual agreements with our major unions to provide tuition refund arrangements for our union-represented employees as well.

We have been involved in cooperative education since 1919. Our participation in cooperative education has steadily expanded, with our involvement at the present time really extending from Maine to California. We how have 169 designated cooperative training programs that involve more than 50 different educational cooperative institutions. During 1980, General Electric had a total of 877 cooperative education students on assignment, of which 14% were minority males and 25% were women. This participation in cooperative training activity is a two-way street, enabling us both to provide training and to take effective steps in affirmative action.

Our students receive training on bona fide jobs, where the work they do is tailored to a combination of their skill experience capabilities on one hand, and their educational experience and development on the other hand. As these students come back to us, their training assignments are adjusted and made more complex to equate with their additional educational achievement and their work experience on previous types of assignments.

We treat our students pretty well from a financial perspective. In addition to the base salary arrangements, cooperative education students on assignments with us are treated as full-time employees and consequently are eligible for all of our major benefits activities, including life insurance, comprehensive medical insurance, holidays, vacation, and product purchase plans.

The scope of our assignments touches on all functional activities. While obviously we are interested primarily in engineering, we have students on assignments in finance, manufacturing, employee relations, and marketing.

We currently have a training program in Puerto Rico and in Canada, and for the last fifteen years we have had a series of cooperative arrangements with other foreign countries, many of which have involved the student from a foreign university coming to this country for assignment. In most cases these individuals go back to their native country upon completion of their educational program, although we have had some success in employing these individuals in operations either conducted by or associated with the General Electric Company on foreign soil.

Finally I would like to mention a program that is currently being conducted in the Boston area which involves the major colleges and is directed at a selected number of secondary schools in Boston and Cambridge. It is called Mass PEP, or Pre-Engineering Preparation. This program, funded in large measure by the students who have the academic capability for taking throughout their secondary education range courses in math and science that would prepare them for eventual enrollment in engineering institutions. This program has been in operation for two years, and while it is too early to judge how successful it will be because we started at the seventh and eighth grade levels, hopefully we will very materially increase the number of minority males and women in the Boston area who four or five years down the road will enroll in various engineering colleges and universities across the country.

SPEAKER FROM AUDIENCE: Many educators at the secondary level do not know what technology is all about or how it has changed. The National Alliance of Business has a program to allow a teacher to go back for a prescribed period of time and learn these things. The only problem in this country is that because it is funded initially from the Department of Labor, your community has to rank very high on the poverty point scale. Other corporations should develop similar programs to put some teachers back into industry so that there will be more relevance in the classroom.

WR. WAGG: We are also fighting for paid educational leave for teachers. As a matter of fact quite a few of the provinces in Canada already have provisions for teachers to, in effect, have paid educational leave for upgrading.

MR. RICHTER: There are some dangers, in that you can not take an individual whose academic background is devoted primarily to elementary school education and make that individual an engineering technician or a high tech skilled individual overnight. We are talking about a relatively extensive period of time. There is, in fact, a proposal currently before the state legislature to establish a so-called Bay State Skills Commission, 50% of the funding hopefully to come from the state and 50% from business and industry, to establish education and training programs to do some of the things you mentioned.

DR. WILSON: It is my impression that probably 80 to 85% of the membership in the Cooperative Education Association are representatives of institutions and that the remainder are from corporations, and amongst those they are probably all representatives of large corporations, which is not a good distribution. In fact, most cooperative students throughout the country are employed by middle-sized and small employers, and those are the ones we never get to exchange conversations with at activities such as this.

SPEAKER FROM AUDIENCE: The values of cooperative education are not necessarily self-evident. Every single one of the people on this panel has said in one way or another that you have got to justify and document what you are doing. This may be the key to what happens over the next five to ten years in the growth, development and success of these programs, because if you do not get the backing and support in times of economic austerity, whether it be from the corporate world or from federal funding, the whole thing will go under.

MR. LEETSMA: When I had responsibility for the federal cooperative education program at a certain level, it became difficult to justify continued federal involvement in a program which was so self-apparently good in all respects and was in a very large sense self-financing. Obviously justifications had been developed for a federal role within that nexus, but in a time of severe economic constraint it becomes a question that gets reexamined.

SPEAKER FROM AUDIENCE: I am involved in an alternative placement program, and I am interested in hearing from representatives of business how we might sell to business the benefits they might receive from working with students in the secondary level who are not strong machinists. You are interested in students who are in the technical fields, pure science, heavy natural sciences, but there is another population out there that is not math and science oriented.

MR. RICHTER: I think you can sell to business on a local level, particularly if there are needs for lower skilled types of individuals. In the last decade and a half General Electric in the Lynn area has been involved with the National Alliance for Businessmen and other federal agencies. We conducted programs directed at the individual who had virtually no educational achievement level and was functioning maybe at second, third and fourth grade levels. There are all sorts of educational materials available that can be utilized to conduct such activities which can be helpful both to the community and to the company, but you have to look at it from a quid pro quo perspective. There has got to be a pay-off for the company to get involved in that kind of activity.

SPEAKER FROM AUDIENCE: Would your company see that there is a pay-off?

MR. RICHTER: Yes. As a matter of fact I was associated with a program in this area that over about a three and a half year period addressed more than three hundred individuals who just could not walk into one of our employment offices and be hired for an entry level job. To give you one aside, I talked the other day to an individual who went through that program and who went on and got his Master's degree and is now working on a doctorate.

MR. LEETSMA: That is one of the powerful practical realities of the cooperative education concept, that it opens doors and stimulates motivation in a way that wonderful things happen. I think as a result of today's session, from the interaction both ways, we have a better sense of some of the questions, and maybe some of the answers have become clear. Thank you.

SESSION 1: CROSS-CULTURAL DIMENSIONS OF ESTABLISHING WORK-EDUCATION-LINKED PROGRAMS

Pierre Casse
President, Society for Intercultural Education, Training, and Research
United States

We all agree that a gap exists between the educational system and the working environment. In order for us to appreciate the cultural dimensions of that gap, I would like first of all to examine why it exists, and then identify the reactions that people have when they find themselves confronted by it. Finally I will present a few guidelines that we could implement in order to ease the transfer process from the educational system to the working environment.

Everything that we say and do, everything that we produce is cultural, although we may not realize the extent of it until someone from another culture points it out. Words, for instance, are culturally loaded. Take the term "human resources." We did not use this term ten or fifteen years ago either in the U.S. or in any other part of the world. Today we do, and we in the West have a similar response to hearing it. But if you go to Asia, the expression gets a negative reaction. Why? It implies that people are like machines, like equipment that you use in order to achieve certain results. To Asians, people are not resources, not lemons that you squeeze, not pieces of equipment that you use. They are human beings. Here let me suggest that perhaps we should be a bit more careful in using the term "human resources," because from a cross-cultural perspective it could trigger some very negative reactions.

It follows, then, that the educational system and the working environment are cultural entities, each having its own values, beliefs and assumptions. Therefore, when we talk about the interaction between the two, we are talking about an inter-cultural experience.

What values, beliefs and assumptions does the educational system in the U.S. support and convey to young people? We can begin by comparing life to a staircase on which there are basically three checkpoints: to learn, to work and to enjoy. At the beginning of young people's lives they are at the bottom of the staircase; their task is to learn. Then they organize themselves to work very hard, to take the pain, to plan in advance, to be patient, get the support, go by the book, respect the rules and so on. This way they will go up the staircase until one day when they will reach the top and will enjoy themselves for sure. They will be happy.

Three basic assumptions are operating here: that people control their lives, that they plan and that they are responsible. If they do not get to the top and enjoy their lives when they are fifty-five or sixty, it is because they did something wrong. They did not organize themselves in the right way, did not work hard enough, were not patient enough or did not go by the book and respect the rules that the educational system laid down.

But what happens to some young people when they move from the educational system to employment? Some join a company, work very hard, go by the book, do everything they were supposed to do in order to get to the top in their company, yet in spite of this they get stuck in the middle of the staircase. Others get stuck in the middle after being very successful in their jobs, then for some strange reason they suddenly go down two steps. These people turn around and see that someone next to them, who is not doing everything one was supposed to do, is going to the top. Some people reach the top very quickly but they do not enjoy because what they get is not all that they expected. Worse than that, some people make it by fifty-five and are ready to play, but find another staircase in front of them; it is not over yet.

Most people have four basic needs which they expect the work environment to fulfill: the need to know, to understand, to create and to enjoy. People want to be informed about what is going on in their company. They want to understand why managers make the decisions they do; they do not want to be passed over like robots or mere pieces of equipment. They want to have an opportunity to use their imaginations and to be creative. Finally, they want to enjoy. But the work environment often does not satisfy these needs. Some people get highly distressed when confronted with this situation. They start to criticize everything that goes on in the company, or they become terribly aggressive. Others withdraw and invest their time and energy outside of the company.

How do we approach this gap between what the educational system leads people to expect and what the work environment actually delivers? We can allow one to impose upon the other its values, assumptions and vision of the world. The companies, for instance, can tell the educational system exactly what they need so that the system can adjust and adapt its programs for the benefit of the companies. In this way companies will not have to retrain new employees or train them from scratch. This model, however, is one-sided.

Another possibility is that perhaps the educational system and the work environment can learn something from each other. Perhaps they can adjust to the needs and the expectations of the people and the decision-makers who work in the two systems. This would be a give and take process.

We might go beyond this learning process altogether and create something brand new. This would be a synthesis, a result of cultural synergy, or creativity.

We have to take many factors into account before deciding which model, which process, is more effective and more efficient. The important idea is not so much how to prepare young people so that they will be able to integrate themselves into the working environment in a smooth way. The issue is how to prepare them to know what is going to happen when they get there, and to know that they have to bring changes into that environment as part of their role. This is what organizations should expect from them, not complete adaptation. That is bad for young people and bad for the organizations too. It will not be that easy. Young people should know that they will have to cope with some strong resistance, and that managers in the companies are not going to accept their bright ideas right away.

What can we do to ease the process of transfer from the educational system to the working environment? Granted, we can learn from each other, but we can also go beyond that and be creative as in the third model. A system which worked very well in the U.S. forty years ago involved using people from the private corporations to teach in universities and colleges as part of the educational system. But things are so complicated in this country now; you need so many credentials in order to teach. Yet we should try to use people who are good in the organizations so that they can bring the organization into the educational system, and use professors and students as consultants in organizations. This will not be easy either. People from universities will speak a language that nobody, not top level managers nor employees in the organization will be able to understand; and if working organizations teach, students will have the same problem. They will not believe what they hear. It will be another culture. Each will have to adapt and adjust.

SESSION 2: USING WORK EXPERIENCE IN TEACHER PREPARATION

Kenneth Edison

Director of Training, Northeastern University
United States

Historians have often said that whenever there is a scarcity of resources within a particular society, the economics, the social and the political problems of that particular country begin to force the people to rely on their inordinate creative energies to resolve the dilemmas with which they are confronted. I think it is very clear from the remarks that were made this morning in the opening session by Dr. Nicol, Mrs. Shirley Williams and Mr. Orfila that we are currently faced with this kind of situation world-wide as we look to the 80's.

Today we will begin to address some of the issues as they relate to schooling, to training, to a productive life of work after training, and to concepts that imply that learning and work are ongoing. Although we have completed certain credentialing or professionalization processes, this does not necessarily mean that learning stops; in fact, it is something that must keep abreast of the changes in society if it is going to be related to work after training.

We will focus specifically on two areas: first, short-comings in teacher preparation; and second, some traditional approaches to resolving these short-comings, and the benefits of integrating work experience into the education of teachers. We will look at the use of work experiences as they function within our educational institutions to prepare more students as well as more teachers.

I would like to make one quick note about what we at Northeastern do at the training center and its specific application to the training of faculty and administrators in cooperative education institutions. We try to apply what I often refer to as a "triadic consultation model." This means that we at the center function primarily as external change agents, external consultants or external experts within the cooperative education field. We work with teams of faculty members and administrators within particular institutions and help them to resolve from a cooperative education perspective the problems with which they are currently confronted. We try in our training sessions to give them some tools to work with, so that when they go back to their institutions, they can apply in a more practical manner the important concept of combining theory, practice, education and work in preparation for a productive life of both learning and work.

Friedrich Edding

Max-Planck Institut für Bildungsforchung
West Germany

Most teachers in Germany have life-time contracts. Their vocational mobility is low. Their practical life experience is very much limited to the world of educational institutions. Classroom teaching as a rule dominates in the German educational system. Some facts, however, are to be mentioned as important exceptions from the rule:

1. Under recent regulations students in the last years of primary school (grades 8 and 9) are given increasingly opportunities to work periodically in industry under the cooperative guidance of teachers and industrial instructors.

2. Half the age group 16 to 18 is working under apprenticeship contracts, implying a combination of training in skills, productive work and public vocational part-time school. Consequently, some cooperation between trainers in industry and school teachers is required. Teachers without working experience outside the classroom cannot be expected to be sufficiently useful in these two kinds of cooperation.

3. Many teachers in full-time schools are teaching subjects requiring up-to-date knowledge of production and other business processes. This knowledge can often not be gained sufficiently by using the media offered by schools, libraries and distance teaching. Recurrent practical participation of teachers in industrial work seems to be advisable in order to avoid obsolescence of teaching in certain subjects.

The problems to be solved, therefore, are: whether all teachers or some kinds of teachers should be obliged to gain work experience in industry; when this experience should take place; how long and how often it should be; and how it should be organized. The theoretical discussion of these problems has led some educators in Germany to the recommendation that all teachers should have work experience outside the classroom. This postulate is based on the following general reflections: Certain abilities, required in all ways of life, cannot be taught and learned sufficiently under classroom conditions; e.g. to apply knowledge to practical tasks, to cooperate with people of different competence and outlook for useful results, to decide how to act in unforeseen work situations. Such abilities should characterize all educated persons and should, therefore, be developed in all educational careers. Educational institutions, however, are typically restricted to classroom teaching. Variations like laboratories, workshops and simulation machinery are used, but cannot contribute enough to develop the essential faculties of integrating thinking and action. Teachers who are trained in classroom conditions only cannot be expected to transfer these vital faculties to students. This is particularly important in the case of teachers who are supposed to prepare students for practical vocational tasks. But in principle it should have implications for the preparation and recurrent training of all teachers.

This principle, however, is far from being generally accepted in Western Germany. Nowhere in this country are teachers in general education obliged to work for some time in industry or in social services, either before or after entering the profession. In the recruitment and preparation of teachers for vocational schools the German tradition has favored long practical experience. Formal qualification in a trade was still expected in the 50's from most of the teaching staff in vocational schools. This implied a training below university level.

It is felt widely in Western Germany that there is a strong systemic difference between teaching in schools and teaching in industry. The optimal division of labor between these two kinds of organizations in order to produce most efficiently the vocational competence needed for fast changing kinds of jobs is increasingly discussed.

In view of these developments numerous reforms have been proposed. To indicate the main tendencies it may be sufficient to outline here a more radical and a more moderate reform concept.

According to the radical concept, all schools and all institutions of higher and further education should develop practical as well as theoretical basic abilities and key qualifications. They should periodically give students and teachers leave of absence for experiential learning in various practical work and seek cooperation with industry. But this integration should not in any respect weaken the autonomy of educational institutions. These institutions should primarily serve basic educational goals. And they should be aware of the fact that they are, notwithstanding occasional periods of experiential learning outside, essentially restricted to teaching and learning under school conditions. Educational institutions should not consider it their main task to deliver to employers the immediately needed labor force, perfectly prepared for actual job requirements. Nevertheless, schools should have the full responsibility for the integrated education of all young people until they come of age.

The first and the recurrent adaptation of graduates from the educational system to job requirements should in this division of labor be entirely the task of private and public employers. They should on their own responsibility and financed by their own means develop the training institutions and staff needed to fulfill this task. The dividing line would then no longer be drawn between general and vocational education, but rather between education and industrial training. Such a division of tasks should not exclude cooperation between the two systems. Leave of absence from educational institutions for experiential learning presupposes the willingness of employing agencies to provide opportunities for this kind of periodic participation in the production of goods and services, just as employees in the production system should have the possibiity to return periodically to educational institutions, and the training staff of industry should occasionally cooperate with school teachers in curricular work and in teaching.

The more moderate reform concept does not oppose the general goal of integration and of finding an appropriate division of labor between the educational and the production system. But in the moderate concept some of the radical proposals are regarded as rather utopian. To integrate general and vocational education in all educational institutions is considered illusory, because strong traditions stand against it and because the traditional differentiation corresponds in general with the demand of adolescents and parents as well as with the interests of industry.

Employers and their organizations express the interest in having a chance to develop and screen adolescents in productive work and complementary instruction immediately after they have left the obligatory school at the age of 16. They are willing to cooperate with the educational system under the terms of the apprenticeship contracts. They are also willing to cooperate in the preparation and recurrent training of vocational teachers.

Employer organizations feel strongly that either their members or special institutions set up and financed by them are fully capable of providing all the education and training needed by their employees inside the firm. The proposal to integrate general and vocational training in educational institutions is substituted in this concept by the goal of achieving integration inside employing agencies and in institutions set up or controlled by employers.

Tendencies as outlined in these two ways of thinking about integration and the division of labor influence the actual developments in teacher preparation. Following the movement for integration, a tenth or eleventh year of compulsory school is currently being introduced, designed to prepare adolescents for vocational choice and entrance into employment or apprenticeship. The practical part of this preparatory year is provided in some states by industry and in others by the schools. It is a kind of test of whether integration is better achieved in schools or in cooperation between schools and industry.

There is now a strong tendency to favor the integration of full practical and theoretical teaching competence in the same person. Teachers of commercial education were the first to formulate this in a policy program of their nationwide organization. It proposes that formal vocational qualification under an apprenticeship contract should be made a condition for admission to respective higher educational institutions. It seems probable that other organizations of vocational teachers will follow this example and that these proposals will be taken up willingly by legislators. A reasonable solution of the problem of how to prepare teachers for vocational education seems therefore achievable in the near future.

Participation in production, for a long time regarded as rather unsuitable for teachers of academic status, appears now to be increasingly recognized as a necessary complement to continued theoretical professionalization. The main problem arising in the future will probably be how to find suitable periodic jobs for large numbers of teachers.

Kaj Spelling
Royal Danish School of Educational Studies
Denmark

If by "work experience" is meant primarily experiences from other sorts of work than teaching, for instance work in factories, service organizations, etc., I shall just state this: In Denmark teacher education for teaching in the Folk School takes place at 29 colleges of education dispersed all over the country. The training takes about four years after 12 years general schooling in the Folk School and the Gymnasium. Because of the prospects of unemployment of teachers in the future (the birth rate in Denmark was in 1980 at its lowest since 1870), admission is restricted and many applicants are refused every year. The applicants are given a certain priority if they have documentation for experience in working life outside the educational system. This means that such work experience is quite common before entry into a college.

A few more words about the initial training: It is not possible to learn how to be a teacher at a college of education. By attending a teacher training program, one can learn a long range of necessary prerequisites for the job. But this will never be sufficient.

The expectations drawn from student teaching have been high. But it is a fact that in the traditional form student teaching is very different from being a teacher. There is a difference with regard to responsibility. The teacher's responsibility for the pupil's development, the social life of the class, the relations to the parents, towards the authorities which employ him, etc., cannot be reflected in the role of a student teacher.

Many professionals in teacher training have been concerned with the problem of the relationship between theory and practice. The most promising way seems to be to take practice as the starting point for working with educational theory and then return to practice. But the problem is that the students in the initial teacher training have no practice as teachers to serve as a starting point.

A knowledge of educational theory is one indispensable part of the teachers' professional background. But in the process of acquiring this knowledge theory must be linked to the actual practice of the student. It may be dangerous to expect great things from the direct application of educational theory to the students' future problems as teachers in a classroom.

There is a general agreement about the importance of in-service training of teachers. In one of the latest international publications from the Commission of European Communities (1979), it is said in the introduction that, "The Council of Ministers for Education views this--in-service training of teachers--as a factor of capital importance to the success of community projects involving cooperation in educational affairs." The said publication stresses several times the relation between in-service training of teachers and "the concept of lifelong education which the teachers should benefit from as well as contribute to."

In a workshop in Strasbourg in October 1980 held by the European Council in cooperation with my institution in Copenhagen, The Royal Danish School of Educational Studies, the Head of the School Division mentioned a special point in this connection. He stressed the importance of bringing new ideas into the classroom through in-service training of teachers because of the situation that only a few young teachers could be recruited as a result of declining enrollments in schools. Therefore, it is vital to go as far as we can in research and evaluation of in-service education of teachers.

Because of the complexity of our field there will always be a need for many foci. The reason for the different foci is--among other things--that different groups have different interests in the outcome of an evaluation or a research. The policymakers and those who are paying the bill will first and foremost ask for evidence of effectiveness, and the teachers will want evaluation and research to tell them which INSET activities are giving them the best help in their many-sided work with pupils: subject learning, social learning, education in democracy, preparation for examinations and so on. It seems that one single form of evaluation can rarely--if ever--satisfy both needs. If the truth must be told, we know very little of the effect, especially the long-term effect, of all the trouble we take trying to establish the best possible in-service training for teachers.

The effective way of helping teachers in their job will always have a direct connection with their daily work. It means that school-based or even teacher-based in-service training is preferable to university-based courses.

I shall point to a few different ways in which the teacher's classroom work plays a dominant role in training and evaluation. The first one concerns the teacher's active role in the evaluation process. The teacher should act together with the researcher and the administration in a partnership. From the preplanning phase to the final evaluation, these three groups of persons should act on equal footing. The consequence of this might very well be a breaking-down of these categories.

Another extremely important aspect of the teacher's active participation in the evaluation of in-service training is the use of the teacher's knowledge and experiences from their practical work in the classroom. The time spent filling the bucket as the task of in-service training should by now have come to an end. The dialogue should consist of the fruitful meeting of the teacher's experiences with the trainer's special knowledge and insight.

School-based in-service training may take the form of study circles in the individual schools, on a very wide scale and involving radio, TV and consultants. There is a different form of school-based activities, where the training is carried out in such a way that teachers are directly involved in a pedagogical developmental project. Very often this sort of work will take the form of action research, and we have a very promising model where training and research are already connected.

How could a teacher learn more about his job than in a situation where he is in close connection and on equal footing with an educational innovator and researcher, and where he is concerned with developmental work in his own school? As to the evaluation of this sort of INSET activity, it could add a new dimension, namely the degree to which the developmental work has succeeded.

I want to put in a last remark about in-service training and the work of the teacher. I am afraid that not very many people will agree with me. In OECD in Paris I have on several occasions put forward the following point of view, but usually I have been met with almost no response: When we consider the further education of teachers as a part of their job, then the aim of these programs is to support teachers in their actual work in the classroom, in their cooperation with colleagues and parents and so on. Therefore, these programs should not primarily lead to promotion and higher salary. A teacher training system which gives any kind of promotion, e.g., the right to teach older children, runs the risk of the most enterprising teachers moving to those parts of the system which for one reason or another have the greatest prestige.

Helmut Winkler
College of Industrial Education
Korea

1. Preface--Teacher Education for Vocational Technical Teachers in the Republic of Korea

The Republic of Korea is a developing country on the threshold of being an industrialized society. During the last two decades the economic development was heavily dependent on export-oriented industrialization, mainly in the fields of chemical and mechanical industries. The only natural resource of the Korean nation is manpower, whereas raw materials and energy resources are still rare in the country. Manpower has to be developed according to the needs of heavy industrialization. In the educational field, therefore, a great emphasis is now laid on vocational technical education.

2. The New "Double-Major" Concept of Technical Teacher Education at the Chungnam National University

In 1977 the Korean government decided to centralize vocational technical teacher education with a very unique "double-major" concept at the Chungnam National University (CNU) in Daejon, a provincial capital in the midst of the ROK. The concept follows three main ideas: the effecting by centralization of technical teachers' education; the close relationship between theoretical and practical work; and the double-major system of engineering and education. The College of Industrial Education (CIE) at the CNU is specialized and has been assigned the functions of pre-service technical teacher education (charged with the pedagogic mission and with competence in theory and practice), engineering education (strengthened basic engineering, intensified through laboratory, workshop and work experiences), industrial education and technology research (curriculum development, supply of teaching materials, technology research), and in-service teachers education (industrial and high school teachers).

A cooperative project between West Germany and the Republic of Korea will help to overcome the shortage of qualified teaching personnel. The aim of this project is to supplement and improve the training of technical teachers by developing and introducing model courses in the field of chemical and mechanical engineering, so that the graduates can assume teaching functions at technical high schools in accordance with the requirements of Korean industry.

3. The Present State of the Project

The project is now in its realization phase. The first portion of laboratory equipment from West Germany for the departments of chemical engineering and mechanical engineering at the Chungnam National University has already arrived at the College of Industrial Education, has been installed and is already being used in training programs for technical teacher students. Some scholarships for Korean faculty members within the academic exchange program have already been awarded and others are planned for the next few years. Three long-term experts and one short-term expert are presently carrying out their teaching and advising mission at this college. Some other short-term experts are expected to arrive within the next few months.

4. The Curriculum within the "Double-Major" System

4.1 Overview

The student has to take two majors: engineering subjects and pedagogical studies. The graduate earns the certificate of a grade one technical teacher and also reaches the qualification level of a Bachelor of Engineering. The Teacher's Certificate enables the graduate to teach at technical high schools. The emphases in the curriculum are as follows:

- --modern curriculum
- --intensified basic subjects
- --reinforced intercommunication between engineering majors
- --intensified laboratory and practical education through field practice in college/industry cooperation program (see 4.3)
- --intensified special financial support and privileges to induce qualified professors and competent students
- --pre-service teaching training
- --education theory complemented by laboratory and work experience
- --specialized teaching aids.

4.2 Cooperation with Technical High Schools

The Chungnam National University has a nationwide close cooperation with all state technical high schools. Each student has to practice teaching at a technical high school for at least four weeks. During this time he has to prepare and teach several lessons. The student will be tutored and supervised by a senior teacher.

4.3 Field Practice--Cooperation with Industry

The requirement for field practice is 4 to 12 weeks (with four weeks as a minimum requirement). The field practice has to be done during holidays in the junior or senior year (third to fourth year). The CNU provides internships in as many firms as possible. The CNU has a formal cooperation program with six of the companies located in the vicinity of Daejon (ISWACO--Industrial Sites and Water Resources Development Company; Daejon Leather Industrial Company, Ltd.; Aekyung Company, Ltd.; Hankuk Reeyon Industrial Company, Ltd.; Hankuk Paper Manufacture Company, Ltd.; and Nam-sun Machinery Works). The latter cooperation includes also collaboration in research work between the university and industry.

The legal status of the intern is that of a student; i.e. he is not in fact employed and hence earns no money. During field practice interns are supported by a special office in the department for academic affairs in the college. Special introductory courses prepare such students for field practice.

5. Some Remarks about Cooperation

5.1 German-Korean Cooperation

The German side has greater emphasis on practical work and educational subjects as important parts of technical teachers education. The Korean side, following not only traditional Korean educational goals and means, but also the American ideal of theoretical engineering education, emphasizes more the basic, applied and very specialized branches of applied technology. So this cooperation naturally has some critical areas, especially in the fields of workshop activities, teaching practice, and field practice. Cooperation will be improved by a cooperative research project: "Qualification Requirements of Korean Industry."

5.2 Cooperation with Schools

Due to legislation cooperation with schools is very close and seems to be without problems.

5.3 Cooperation with Industry

The small amount of field practice--four weeks seems brief in comparison to the minimum requirement of 48 weeks to 3½ years of vocational training in the German system--is a result of low support by Korean industry. This industry is more engaged in the field of vocational training (vocational training institutes, private and informal vocational education). Due to the economic situation of the Republic of Korea, industry cannot afford great financial support for the formal educational system. Therefore, cooperation has to be improved.

6. Some Obstacles and Problems for Implementation

We can see that a main problem, seen from the standpoint of a Westerner, in implementing the "double-major" system is the general low esteem for practical work that is prevalent in the educational field, especially in higher education in Korea. The traditional Confucian society believes in education but in a very formal way. The still remaining hierarchic and pyramidic social structure in Korea requires processes of social selection. So certificates of higher education are still the ticket for highly ranked positions. Besides this, the content of the curriculum is almost unimportant and not well related to the qualification requirements of society, industry and public services. Improvement can be made by implementing the new curriculum for training technical teachers following the above mentioned "double-major" approach.

SESSION 3: EMPLOYER-EDUCATION INTERACTION MODELS

David J. Boud
University of New South Wales
Australia

One of the most significant problems faced by programs which attempt to combine the learning that is pursued in educational institutions with various aspects of work experience is the difficulty of using this work experience as a learning experience for students. Often there is a vast gulf between the types and the nature of the learning that takes place in colleges and universities on the one hand and the experience of the workplace on the other. It is undesirable for students that these worlds exist independently of each other.

My own aims here are to argue that both educators and employers should give increased attention to the nature of learning in cooperative education programs; to suggest particular areas which might receive such attention, especially those of responsibility for supervision, methods of supervision and preparation of students; and to illustrate some of these points by reference to a Kellogg-funded joint U.S.-Australian project on experience-based learning and the facilitative role of teachers.

Many important issues remain to be addressed, and some of these I will mention as a prelude to an open discussion on ways of bridging the gap between educational institutions and the world of work.

A wide range of work experience is to be found in Australian education--from the traditional U.K. model of the sandwich course degree structure through the work placements to be found as an integral part of most health science courses to the new programs to be found as part of the Federal government's initiative on the transition from school to work. I do not wish to examine the varieties of provisions which might be found. Davie provided a good overview of Australian sandwich courses at the First World Conference, but I wish to focus on one problem which is common to all the models I have outlined: how to bridge the gap between the educational institution and the organization which provides the site for experiential learning and often employs the student.

Educational institutions and other institutions, companies, businesses and government organizations appear to inhabit different worlds. They have different social norms and procedures; they are organized around different principles; and they have different goals. In particular, in the world of work the individual is subordinate to the task and the goals of the workplace. In education the reverse is the case, at least in principle.

The problem which commonly presents itself as a barrier to the effective use of work experience, field placements, and other forms of site-based experiential learning is the lack of effective liaison between the responsible educational body and those in situ. This is not just a problem of lack of communication, but is one with organizational, ideological and educational components. It is one that can only be addressed through a clear analysis of responsibilities and an explicit clarification of roles. It can be summarized as: how can one turn a work experience into a learning experience?

Malcolm Brewer
Sheffield City Polytechnic
United Kingdom

I want to look, from the academic institution's side of the fence, at the credibility gap that exists between academic institutions and industry. To do this, let us first of all examine interface. Obviously we as an educational institution are looking for students, and in the future many of these students will come from industry. So we have a role to play in training, and increasingly in retraining. We are looking for sandwich placements, which absorb an enormous amount of resources. We are looking into industry to provide projects, i.e. problems that students can solve as part of their academic studies, and particularly in the final year of these studies. We are looking at industry to provide not just job opportunities, but opportunities for members of staff in joint research, in consulting, and an opportunity for the academic institution to make a significant impact on the industrial and commercial life of the community in which we live. So I identify these few areas as part of interface.

Is there a vehicle for addressing these problems? In the past most of our activities in an academic institution were discipline based, and the departmental approach to all of these problems was essentially discipline based. This has been good in the sense that the particular department that has been looking for students knows what it has to offer and knows what sort of student it is looking for. If we look into sandwich placements in specific disciplines, we see that the people connected with these disciplines have to be involved in the search. The same principle applies to projects, research and consulting concerned with specific disciplines.

What is wrong with the existing arrangement? First, the real world is not discipline based; it is multi-discipline based. Secondly, with the growth of courses in academic establishments, the overlap between courses is increasing. More and more courses, particularly on the business and commercial side, have a significant overlap in their academic content. Thirdly, what was easy to attain in the comfortable economic times of the 50's, 60's and early 70's may not be so easy in the more difficult times of the 80's and 90's. These are economic problems that all of the developed countries are facing. They not only impact on industry and commerce, but on our own institutions as well. Finally, our major market has been the 18 to 21 year old population. Throughout the developed world this age group is about to go through a sharp decline, so we have to re-examine our major activities. If we are going to construct a new vehicle, then certainly it is important to leave the responsibility for many of the decisions as close as possible to the people involved in the activities. We must avoid creating bureaucracies. Above all, we must be cost effective.

It is important that each academic institution build its own vehicle for developing this sort of activity. The vehicle that seems to be developing in the U.K. does vary enormously from one institution to another. We have pulled together one section or department which encompasses the following interests: sandwich placements, consulting and research, and short courses.

Now the role with respect to sandwich placements is a supportive, coordinating, leading one. It is not a directive role. It exists to help people in different courses and different departments obtain placements, to help students and to help monitoring. Whatever task is necessary and cannot be done at the departmental level would be supported from this central department. In the project area one of the major aims of this department is to actively seek out projects and, in particular, to talk to both students and industrialists about cooperative education students who are in industry. Each year we have 3,000 such visits to industry by academic staff, but the feedback from this tremendous resource, both financial and human, is pitiful. We are not developing this resource as actively as we should be doing.

With regard to consulting and research, we in this department are taking on real projects and real problems, not just small discipline based ones like those of a chemical company that wants an analysis of a particular problem. We are looking at major production problems and greater economic and social problems which are multi-disciplinary and require staff from different disciplines and academic backgrounds to solve. We have to make more productive use of our human and physical resources within the institution in which we serve.

Now in the U.K., and this is probably unique to the U.K., one of the ways of doing this is to establish some sort of company status. This is easier to do in the university sector than in the public sector for technical and legal reasons. However, there are many technical problems connected with creating a vehicle for establishing a better method of operating consulting and research.

In the area of short courses, we feel that a department should provide a central administrative and secretarial support service to lighten the load on the faculty and staff who want to run these courses. Again, this is all part of the central coordinating supportive role.

Finally, to link all of these together we must think about marketing and public relations, and we have to appoint people with expertise who can market the human and physical facilities of the institution we serve. This is very important for the financial survival of some institutions, and it is against this background that I am talking. If we do not bridge this credibility gap with industry and commerce, both in the local community and the national community, and make much more of an institutional impact, then the future is very bleak indeed.

SESSION 4: COOPERATIVE/SANDWICH-TYPE PROGRAMS FOR ADULT POPULATIONS

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United States

In a recent article, "Cooperative Education for the 1980's," Dr. Patricia Cross presented this challenge: "Can cooperative education lead the way in integrating and enriching the total learning for workers entering the classrooms as well as for students entering employment?"[1] Dr. Cross indicates that adults now constitute the fastest growing sector of American Higher Education. Close to 50% of all students enrolled in college are part-time students. According to U.S. Office of Education data, the adult learners are typically between the ages of 25 and 38, and three out of five are likely to be women. They are engaged in all types of activities: full-time and part-time employment, home management, child rearing, and a wide range of community affairs. Many are preparing to enter or re-enter the employment market. In 1975, the over 17 million adults engaged in some form of education well exceeded the number of traditional college students. As we in the United States move into the period when a majority of the student population will be engaged in work experience, we may well ponder how the education of the work place can be melded with that of the classroom.

There are numerous adult education programs in this country that utilize work experience as an integral component. Many of them assume that the adult student is in a structural academic program with at least half time devoted to organized study. Although these programs are very important for a limited number of adult students, they do not meet the needs of the much larger number who are continuing their higher education while working full time. The program which I will describe is a somewhat unique plan of cooperative education that serves the interests and needs of adult students who work full time and study part time.

This program is being developed at Sinclair Community College, Dayton, Ohio, and is referred to as "Cooperative Education for Extended Day Students."[2] The plan was largely instigated by requests from part-time adult students who asked to be included in the regular cooperative program which had been well established at the college. Working with a small group of adult part-time students provided the insight and the impetus to develop a modified form of the cooperative plan for adult students with full-time jobs.

Enrollment in this optional program is open to students who are working full time and studying part time toward a college degree and who satisfy the following three conditions: (1) acceptance of the student's current employment by the college as a suitable learning experience based on a mutual understanding of the educational potential of the job and the work environment for the given individual, (2) commitment by the student to carry through prescribed activities designed to facilitate and to evaluate the educational outcomes of the current employment in terms of self-development, acquisition of knowledge and skills, and career advancement, and (3) willingness of the employer to participate in the program, the relationship with the employer to be initiated by the student as an employee with appropriate follow up by the college.

Once the cooperative education arrangement is established with the student and the employer, a faculty coordinator is assigned to act as a facilitator in the educational use of the work experience. Learning possibilities are developed with the adult student and appropriate guidelines are provided to activate observations and reflections related to the individual's educational goals and needs. The coordinator also maintains a liaison with the current employer in keeping with the individual prerogatives of both the student and the employer in the personnel relationship. The student is required to keep a journal of significant observations during the work period as an aid to writing a final and comprehensive evaluation of the learning outcomes of the experience. One or more individual conferences, along with a visit at the work site, are directed toward the interaction of study and work experiences.

College credit can be earned for the work experience based on demonstrated achievement of learning outcomes by the student. Although the student's employment supervisor will be rating the work performance, to be taken into account in the crediting process, the responsibility for evaluating the educational outcomes rests with the faculty coordinator. It is the student's responsibility to demonstrate through the journal, essay evaluation, and other forms of presentation a level of substantial learning to justify college credit. The amount of degree credit and the rate at which it can be earned through work experience is governed by the same policies as for the regular cooperative program. At Sinclair this means that an adult part-time student may earn a total of 12 degree credits for cooperative education at the rate of four credits for three months of full-time accredited work experience.

It is significant and reassuring that virtually all employers approached to participate in the program have responded favorably. In a sense one might expect employer cooperation because the program, suitably presented, appeals to management's best interests in supporting the upgrading of employees. Moreover, employees engaged in this form of education are likely to improve in their effectiveness on the job. A proposed extension of the program is to offer to employers at large in the Dayton metropolitan area the opportunity of nominating interested employees to the college for enrollment as extended day cooperative students. Up to this point the program has been limited to some 100 adult students as a pilot operation because of limitations in staff to accommodate a larger number who might like to enroll.

I should point out that not all extended day students in this program are with employers with whom they wish to remain or who can offer them progressive opportunities. Individuals enroll with differing views regarding their current employment--some with the belief they can advance in their present employment; others with the idea of changing employment; and many with uncertainties of future prospects to be resolved by coming circumstances. It is the aim of the program to be sensitive to the employment situation at whatever stage it may be, and to utilize the ongoing experience in the educational development of the adult student and in the personnel interests of the employer. Throughout my experience with employers in cooperative student employment, I have found them to be generous and understanding in assisting a misplaced employee in making a suitable change. A particular benefit of this cooperative plan is to provide for adults the kinds of reinforcement in skills, self-understanding and other competencies needed to make changes of employment as needed.

As the program evolved, it became evident that many adult part-time students were in need of more information and advisement on academic and educational planning and selection of courses than is readily available to the extended day student. The faculty coordinator, who identifies with the goals and interests of his or her cooperative education students, can become an educational mentor and curriculum adviser. The planning of continuing studies follows naturally out of the student-coordinator relationship.

Adults engage in cooperative education with a mature and sincere interest in the interrelationship between studies and work, and they present a new dimension of challenge to coordinators and employment supervisors in the interaction of study and work experience. College teachers also find these adult students stimulating in the classroom.

Because some adults entering this cooperative program may have held their jobs for a considerable time, one might question what could be learned in these situations. Strange as it may seem, many workers in responsible jobs have given little thought to the implications of their work in educational and professional development. Taking a fresh look at daily tasks in the context of self-understanding, learning opportunities and career development, reveals new insights for educational growth. The work-study process may also reveal ways of positive adjustment to routines of the work place that are likely to persist in any form of continued employment. It is obvious that the nature of the benefits to be gained from the work experience for a given adult has to be modified in terms of the individual student, the individual employer and the individual job. And in some cases the desired end results cannot be fully realized.

The United States has long been engaged in a variety of educational programs serving all segments of the population--in formal and informal types of adult education, evening classes, short courses for farmers and tradesmen, trade union courses, extension studies for both rural and urban people, etc. There has also been a long tradition for the place of liberal education in the improvement of one's social and economic condition. But as Harold Taylor[3] has pointed out, "It is only in recent years that the full implications of lifetime and recurrent education have become apparent to the general population, and that colleges and universities have eliminated most of the distinctions between daytime and evening students and the dichotomy between practical and liberal education." The academic curriculum, particularly in community colleges, is now becoming more open with many courses available to students without formalized pre-requisites.

In a similar context, cooperative education has modified the course of its development to accommodate a wider and more diverse range of students and to broaden the scope of learning in work experience to include both general and specialized areas of educational development. In a complex and changing society, the effectiveness and satisfaction of individuals in their careers will depend more on the breadth of their learning through education and experience than on the sheer knowledge and technical skills they may have attained.

Here in the United States adults enroll in higher education for a variety of reasons: to acquire specialized knowledge in their field; to broaden their general education for career development, personal or leisure time enjoyment; and/or to secure the badge of a college degree for career advancement or personal satisfaction.

What workers need in the way of education, according to Dr. Harold Taylor, is what everyone else needs--"A chance to use their talents to the full."[2] This means not merely a talent assessment with advising and counseling, but exploratory study and experience in which there can be an open interchange of ideas, experience and problems. Thus, as adults, they will better understand themselves and how they may join in more fully with the affairs of society.

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[1] The Journal of Cooperative Education, (Winter 1978-79).

[2] National Commission for Cooperative Education, Commission Circular, Fall 1980.

[3] Change Magazine, (July-August 1979).

SESSION 5: PROCESS FOR INSTITUTIONALIZING EDUCATION-WORK INTERACTION PROGRAMS

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Truman College
United States

Truman College is a two-year community college with approximately 6,500 full- and part-time students taking both liberal arts and career programs. Of our students, 20% are recent immigrants from other countries such as the Soviet Union and Southeast Asia, and the average student age is 28 or 29, which is typical of all community colleges in the United States.

We are presently in the process of institutionalizing cooperative education. Last year we were the only community college in the United States to receive a special grant from the Federal government for comprehensive cooperative education programs, which means having work experiences in most or all of the academic disciplines at the college--in the career programs as well as liberal arts programs. This will not be an easy assignment. Most of the cooperative educational programs in the U.S. are related to the career programs such as engineering. In the last five or ten years, however, they have begun to work with liberal arts students, and we will have to do that at Truman if we intend to institutionalize the program college-wide.

In order to do this we must gain strong support and active involvement from four major groups: faculty members, employers, administrators and students. Faculty members must be involved in the planning and implementation of the cooperative education program from the beginning. We at Truman do not believe that you can successfully institutionalize a large-scale program in all academic disciplines based on a single individual's plan, such as my own as a project administrator. We have involved the faculty in writing the curriculum and courses in which they relate their disciplines to work experiences.

Employers are involved not only by providing work experiences for the students; they also help to plan and implement the program. We have an active advisory board made up of approximately 20 employers who meet four times a year and have sub-committees that meet an additional six to eight times a year. They are constantly giving us input and relating their concerns, priorities and needs to our faculty and administrators, and we make no major program decisions at the school without informing them beforehand. Therefore, we are not using employers simply to place our students. We are allowing them to tell us how to improve our educational offerings along with the placement.

Administrators are the catalysts who bring the employers and faculty together. The final group of participants is, of course, the students, who must participate actively by becoming aware of the comprehensive program and the work experiences available to them.

SESSION 6: ASSESSING COOPERATIVE EDUCATION

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United Kingdom

In the following paper I will present some guidelines for the monitoring, assessment and development of the professional training periods of integrated sandwich courses.

1. Introduction

1.1 There are three types of undergraduate course in the university:

a. Three-year conventional (non-sandwich).

b. Four-year "thick" sandwich (in which the student spends one whole session - third year - in extra-mural professional employment).

c. Four-year "thin" sandwich (in which the student spends 20 weeks in professional employment in each of two or three years of the course; in each such year, 20 weeks are also spent at the university).

1.2 In any non-sandwich year, there are 30 weeks of study at the university. The result, in any sandwich course, is as much academic study as in a conventional course. The extra-mural work periods are therefore additional opportunities for the student to gain knowledge and experience.

1.3 It is a fundamental principle that the work done shall be closely relevant to the principal subject(s) of study at the university.

1.4 The university wishes to encourage the four-year integrated course. In particular, it seeks to promote the "thin" course structure. It also wishes to encourage the highest possible quality of extra-mural training. To do so, it is to institute a differential funding scheme, the fundamental principles of which are given in the next section.

1.5 Academic departments of the university shall be funded, in respect of undergraduate courses, as follows:

a. All years of conventional courses shall be funded at par ("unit weighting").

b. For sandwich courses, all years which are of conventional length at the university - i.e. do not include extra-mural professional training - shall also be funded at par.

c. The professional year away from the university, of "thick" sandwich courses, shall be funded up to (but not more than) par, dependent upon satisfaction of the criteria given in section 2.4-2.23 below.

d. Each year of a "thin" sandwich course which includes a mandatory period of extra-mural training shall be funded up to a limit which is greater than par, dependent upon satisfaction of criteria based upon those given in section 2.4-2.23.

2. Criteria for Monitoring the Quality of Funding

2.1 The university recognizes that it is dependent upon the good will and cooperation of many employers, who alone make the extra-mural training possible. The university seeks to secure their maximum help by maximizing the performance of its academic departments in planning and carrying out their responsibility to make the extra-mural periods as effective as possible in respect of education and training for the students, and of efficient work for their employers. The university sees the sandwich course system as essentially a "triangle" of three groups: academics, employers and students, with each group contributing to the welfare of, and gaining benefit from, the others.

2.2 To achieve these aims, a group of sandwich course tutors was asked to propose a comprehensive set of criteria to monitor the performance of academic departments in devising, administering and monitoring the extra-mural work experience periods.

2.3 It is recognized that one rigid set of criteria cannot be equally applicable to all sandwich courses within the university, for various reasons. However, the model set thus developed is given in sections 2.4-2.23. Each course has to satisfy the Senate annually that its performance satisfies such a set of criteria, agreed in advance, if maximum funding is to be gained by the course.

2.4 Does the department have a detailed statement of its aims and objectives with regard to extra-mural experience periods, so as to guide course tutors, other staff and students in respect of such periods?

2.5 Does the department obtain details of the proposed duties of each student in a forthcoming placement, so as to be satisfied about the appropriateness of the duties to the education and training of the student and so as to enable criterion 2.6 to be carried out effectively?

2.6 Does the department use these details to give a pre-placement briefing to the student, so as to improve his efficiency in taking up the duties?

2.7 Does the department monitor the development of the actual duties of the student by visits to the student (and his supervisor[s]) on placement?

2.8 Are there at least two such visits to the student in the case of a "thin" (i.e. 5-6 month) placement or at least three such visits in a "thick" (one academic year) placement?

2.9 Are the visits organized so as to obtain all relevant information and opinions from all persons with responsibility for the duties (these persons to include the student, immediate supervisor, more senior supervisor(s)/training officer(s) as appropriate, and the visiting tutor)?

2.10 Is each such visit made by a member of academic staff closely and commonly associated with the degree course involved?

2.11 Does the first visit take place within the first four weeks of the student's period of employment?

2.12 Does the first visit ever lead the visiting tutor to conclude that some modification of duties would be desirable at some time during the rest of the placement? If so, what action is taken to bring this conclusion to the notice of the employer? What steps are taken subsequently to check on the results of this action?

2.13 Does the department make a request to the employer that the student should be given, before or during the early stages of employment, a reading task which would refer either to the specific duties or to some more general aspect of the work situation of that student? Does the first visit show that this task has been assigned and that the student has adequate ideas how to go about it? If the answer to the last question is "no," what steps does the visiting tutor take to assist the student?

2.14 Does the student provide a written summary of what has been achieved on the reading task, a written summary of the organizational structure in the place of employment and the student's function within it, and a written summary of the day-to-day work, before the second (and, where appropriate, each subsequent) visit, so as to assist the visiting tutor in carrying out the visits effectively?

2.15 Does the second (and, where appropriate, each subsequent) visit include a tripartite discussion by the supervisor, the visiting tutor and the student, to cover the general work of the student and also the reading task?

2.16 In placements which require the student to keep a work diary, is this diary kept effectively by the student, made available to the visiting tutor at each visit, and discussed in detail by him at each visit with the supervisor and the student?

2.17 Does the visiting tutor report adequately and in writing on the criteria listed above, after each visit? Are the reports stored in a systematic way in the department?

2.18 Does the student write a final report on the placement, approved by the employer for submission to the university department? Is the report read by the visiting tutor after the student's return to the university, and discussed by the visiting tutor and the student?

2.19 How does the department incorporate the information gained about a student's performance on placement into the academic record of the student? Is that information taken into account in determining the student's level of degree success? If the answer to the last question is "yes," how is this done?

2.20 How does the department make provision so that course tutors, visiting tutors or other appropriate academic staff may effectively carry out the actions required by these criteria?

2.21 How does the department make provision, in terms of finance and time, for course tutors, visiting tutors or other appropriate academic staff to seek out, negotiate and finalize new and/or improved extra-mural placements?

2.22 How does the department demonstrate to staff that these activities are as important as any other aspect of academic work?

2.23 Is it appropriate for the departments to appoint appropriate industrial supervisors of integrated course students to visiting staff status in the department, and encourage teaching and/or research visits by such persons to the university? If so, what resources (financial and other) are laid aside for this purpose?

SESSION 7: INTEGRATING BUSINESS AND TECHNOLOGY EDUCATION WITH WORK

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United Kingdom

My comments are based on my experience at Middlesex Polytechnic, which is very similar to Northeastern in the sense that nearly all the students are on mandatory cooperative education programs. Our range of placements spreads right across the art and design field, engineering, social sciences, education, and social work. Almost every field except the humanities has a placement program. In this context I am responsible for a large program staffed with about 30 people who place the students. While most people talk from their experience of one course program, my perspective comes from managing a placement program across about 30 courses and trying to work out some elements that are common. The comparison between, for example, placements for engineers and those for jewelry students or designers produces some very interesting perspectives.

As the keynote speakers have mentioned, we must avoid rationalizing administrative arrangements which have emerged out of political settings and look at cooperative education in terms of education's purposes. To put the second half of my introduction into framework, I have delineated three models of cooperative education.

First there is the traditional one in the United States which is associated with Antioch and which is related to the need of students to work their way through college. The philosophy that justifies it is that any experience is valuable and that it is very much a free market for the student's choice of placement. I think that it is still experiential and the students do use it to earn money.

Another model, which is the dominant one in the U.K. and the one that we reacted against, sees placement as integrating the academic curriculum with the work experience. To that extent the central theme of the placement is to produce written work; it is marked for credits, the student is called a trainee in the work setting and the placement is seen as an extension of the curriculum.

At Middlesex we reject that view entirely and work on a different program altogether where we see the placement specifically as an anti-academic experience. We are deliberately trying to break the connections of the student in the placement with anything academic. But unlike the Antioch scheme, it is planned around what the students' individual interests are. We encourage the students to consider any choice. For example, if an engineering student wants to do a social work placement and he can convince a social work agency to pay him a salary, we think that that is excellent and it is something that we would encourage. In this model we reproduce the pressures of getting a job and holding it. It is job oriented entirely; for instance, we do not require these students to do any written work and we try to reduce the amount of tutorial support. Conversely, the academic curriculum is deliberately not geared towards work experience. The purpose of the academic curriculum is to teach the students to think, and so we give them a classic Oxbridge education. Afterwards, we thrust them into the deep end of work experience, which is not monitored by the academic process at all. We want to have a completely different value system applying to it so that the students who are often failures academically can succeed in the work setting and vice versa. Why did we do this, as it is a fairly radical departure from current thinking in the U.K.? Where did it all start?

This model started with our view in the late '60s that the central concern of education should be to teach students how to cope with change. There is no way that in the traditional education structures we can teach people for life. Our whole country is run by professional institutions that believe that if people get qualifications at age 21 they will last them for the rest of their lives, which is absolute nonsense to anybody who knows about rapid changes. What we predicated was that our people would have to relearn and prepare for moving in alternative directions, and we said that the greatest threat to that, or the greatest challenge people would face, would involve a factor of personality.

We thought we would develop a one-year placement program committed to this objective and would keep the academics out of it, the theory being that the academic period has integrity in its own right, and the work experience has integrity in its own right, both in pursuit of the central objective of maturing the student. The basic assumption here is that there is a necessary distinction between academic culture and work culture, and I think that it is a mistake to say that they should be integrated. The academic culture is a different environment entirely from the one in which students ultimately will work, but we believe that the traditional academic setting should be preserved. On the other hand, there is a great emphasis in the U.K. now on developing entrepreneurs who can run small businesses, so we need to give students undiluted experience of work culture while at the same time maintaining the higher academic standards and the atmosphere that we feel is conducive to developing these standards in the students.

An interesting experience was performed with our social science students in which they could either be placed on grants in university institutions or they could go out and earn salaries in supermarkets. There was a theory that if we allowed our students to actually work in an academic environment, they would have a huge advantage over those who had been hauling boxes of goods onto supermarket shelves, but we found quite the reverse. The students who had actually been in universities were doing worse in their final year dissertations than those students who had been yanked out of an academic environment and put into a supermarket. We found that the increased degree of organization and motivation acquired by the students during their practical experience impacted positively on their intellectual abilities.

This type of model can be extended to every type of placement. In our art and design courses, for example, we are no longer putting students into studios; we are putting them into flatwork settings, and we are finding even in the design field that this maturation effect is enormous. Our aim for a successful placement is that the student has a time of reference outside his academic teachers and his academic experience. That is, we define maturity as the ability to stand outside the situation you are actually in. To characterize it, our students are not taught to make trains run on time specifically; they are taught to ask themselves which train should be running anyhow. Most vocational education models teach students that if they are faced with a problem, just to first look for a solution; whereas we ask our students first to ask themselves why it is being defined as a problem, and we think that it is a function of personality change that enables them to do this. Once you develop this ability, you really have an exciting learning setting.

Finally, we come up against a great deal of hostility from academics on our program, because in a sense it devalues the academic process and therefore academics. Most of our employers, for instance, are now telling us that they think that only 25% of the students' future success can be predicted by their academic results, the other 75% being a function of personality. That is precisely the thing for which we think our program is aiming. Our program has quite a unique process of administrative arrangements, unlike that of traditional cooperative education models, and it is something that we want to share with other people.

J. D. Jones
Sheffield City Polytechnic
United Kingdom

I am going to speak about one particular course for one particular type of student, that studying applied statistics. I am a teacher responsible for placing these students, and one of the problems I encounter is that statisticians are generally employed in an organization's service sections. In other words, the main business of the company is not to produce statistics; rather, any statistical work undertaken is used to support the main activity. There are exceptions to this, such as specialist companies and some government departments, but these are not the norm.

A feature of this structure is that the work load is variable both in quantity and type. Because of this it is difficult for employers to consider taking students on a regular basis and also difficult for the College to specify a training program. It is taken for granted that both the student and the employer wish to benefit from the employment in the short term as well as the long term.

Taking the above into account, it appears preferable to have a system in which the industrial experience periods are complementary to the academic study periods. In this system no specific tasks are requested by the employer, the major concern being that the student learns by being involved and productive. In this context the real benefit to the student is the experience of a working environment and the development of his or her ability to cope with real situations.

With regard to assessment, the variety of environments in which students are placed makes it difficult to grade placements. Consequently, a system comprising tutor visits, an employer's report and a student's report is considered appropriate and the assessment is a binary one of being either satisfactory or unsatisfactory. To obtain an award a student must satisfactorily complete the industrial experience periods.

The selection of students for particular placements is always a difficult task. In my experience with courses of two periods of industrial experience, it has always appeared preferable for the staff to do some pre-selection and to put forward no more than three or four candidates for each job offer. The pre-selection takes into account the student's interests and preferences. Our view of this may in part be due to the sparse distribution of job offers and the employer's preference not to be inundated with personal applications.

In conclusion, let me comment that to date, based on over ten years of experience, the system appears to work satisfactorily.

A more detailed account of our system may be found in the following paper: J. D. Jones and G. K. Kanji, "The Role of Professional Experience in Statistical Education," The Statistician 29, No. 3.

SESSION 8: EDUCATION AND TRAINING OF TECHNICIANS AND TECHNOLOGISTS IN DEVELOPING COUNTRIES

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A distinguishing mark of wisdom is humility. Socio-economic systems are extremely complex and those seeking to improve them by education and training programs would be wise indeed to bring to their assignments generous shares of modesty, if not abject humility. The record of intervention in the economies of developing countries by those calling themselves developed is not one of consistent success. Our enthusiasm for collaboration across international boundaries and among culturally different people may dangerously exceed our expertise in intercultural communication and training.

To maximize the prospects for the success of training programs we must discipline ourselves to the necessity of addressing a number of questions in advance of specific planning. Such questions relate to the general economic policy goals of the host country, the compatibility of the training outcomes sought with the social and natural environment, the sensitivity of the trainers to the perceptions and value systems of the trainees, the setting most likely to support the objectives of the training project, the trainers' knowledge of the host country's traditions, and similar matters. Too frequently ignorance and arrogance on the part of trainers have spelled failure, strife, frustration, and waste for all parties concerned. Substantial efforts to understand should precede any initiatives in the design and development of major education and training projects. No matter how expert a person may be in a given area, he/she should not presume to teach or train another person without seeking to know the learner.

Programs in intercultural training and communication are available and should be considered by responsible and ethical educators who engage in international/intercultural training projects. The Society for Intercultural Education, Training, and Research (SIETAR) is one agency dedicated to the advancement of sound trainer preparation.

Special attention may have to be directed to the place of technicians and technologists in relation to other categories of workers in the host country's class system. Work systems are built upon social structures which uninformed trainers may inadvertently ignore.

Strategies will have to be worked out to reduce the likelihood of failure. Consultation on job analysis and work environments is strongly advised. We can also learn from others who have already acquired valuable experience in international/intercultural training projects.

Training designed to strengthen the socio-economic systems of the developing countries is of overriding importance. Issues of appropriate technology, preservation of essential societal infrastructures, proper stewardship of the environment, reliance on renewable resources, and new technology as liability as well as asset have to be examined. To be beneficial on balance, technology transfer through training must be thoughtfully conceived, responsibly developed, and conscientiously implemented. We must be guided in our efforts more by the long-term interests of the developing societies than by the immediate benefits to trainers and trainees.

International efforts in education and training may serve well the prospects of developing countries. Together we must dedicate ourselves to that end.

SESSION 9: GOVERNMENT'S ROLE IN STIMULATING COOPERATIVE EDUCATION/SANDWICH-TYPE PROGRAMS

William J.H. Poole
Director, Policies and Programs Directorate
Youth Employment Bureau
Canada

There are ten provinces in Canada. The provincial governments are responsible for education. There are about 75 degree granting universities in Canada, between 175-200 diploma granting colleges, and some 3,000 high schools.

In 1980-81, there were just over 600,000 enrollments in post-secondary institutions. The secondary (high school) student enrollment was approximately 1.6 million.

The Federal government, through transfer payments to provincial governments, contributes about 1.9 billion dollars each year to post-secondary education. In addition, the Canada Employment and Immigration Commission has spent many billions of dollars over the past decade on the purchase of skill and other training from provincially operated educational institutions. In 1979-80, the Commission spent $669.7 million to train 309,463 persons.

In the context of the development and effective use of human resources, the Federal government in 1976 initiated a Cooperative Education Program as part of its five-year general employment strategy to ensure that post-secondary and secondary school graduates possessed the practical work experience demanded by employers.

The objective of the federal Cooperative Education Program was to encourage and assist the development and expansion of cooperative education in order to more effectively facilitate the integration of high school, college and university graduates into the labour force.

Interested secondary and post-secondary educational institutions were expected to develop and submit program proposals to provincial authorities. If acceptable, these proposals were passed to the Federal government for consideration and approval. If approved, the Federal government paid up to 50% of the costs to a maximum of $100,000 per program over a two-year period. This process recognized that where cooperative education programs have been established in Canada, it has been as a result of the initiative of individual educational institutions; indeed, the very first cooperative education program in Canada was as a result of the initiative of the University of Waterloo in 1957.

To be eligible for federal funding, the proposed program had to be a new or an expanded existing program. The work terms had to be with established employers. The student had to be employed doing supervised productive work, as opposed to merely observing, and be paid. The latter requirement was not applied in the case of secondary school students. With secondary school students, the length of the work term was between 15-50% of in-school time but with post-secondary students, it was 50% and never less than 30%.

Approved proposals called for both levels of government entering into a formal agreement. The province was required, among other things, to ensure that worthwhile programs would not be discontinued when federal funding expired.

Over a three-year period, the Federal government approved most of the proposals put forward. It contributed about $2.5 million to help fund 55 programs.

In 1980, some 16,000 post-secondary students were registered in coop programs in Canada. These students represented 2.6% of all post-secondary enrollment, an increase of 1.7% over 1976. In Ontario, Canada's most populous province, cooperative education/work study programs at the secondary school level increased from 20 in 1978 to 50 in 1980.

Throughout the Federal government's involvement in cooperative education, it has worked closely with the "Canadian Association for Cooperative Education" (CAFCE) in order to maintain the high standards of post-secondary cooperative education in Canada.

The following are examples of programs cost-shared with provincial governments:

Institution (High School)	Program
Greenwood Central High School	Work experience for non-academic oriented students - 6 week work study assignments - 3 days per week
Simcoe Board of Education	Practical accounting, marketing and office procedures
Sudbury Board of Education	Work experience - alternate two week assignment with two weeks of school
Grey County Board of Education	Work experience - one third classroom and two thirds work terms
Lennox and Addington County Board of Education	Business education work terms for grade 12 students - 4 hours per day for 6 months
Halton County Board of Education	Work experience in accounting, stenography and clerking - 5 continuous weeks
Ridgemont High School	Retention of potential dropouts. Work experience in typing, machine shop, woodwork, electricity

Institution (Post-Secondary)	Program
Holland College	Dental receptionist; mental retardation worker; day-care worker - 6 to 8 week work terms
Mount St. Vincent University	Business administration - 1 to 3 semester work terms
St. Mary's University	Business and industry for arts students
University of Waterloo	Behavioural science (anthropology, psychology, sociology) - 4 work terms of months each

St. Claire College of Applied Arts and Technology	Mechanical and industrial engineering
Niagara College of Applied Arts and Technology	Legal assistants
University of Regina	Physics and computer science
University of British Columbia	Engineering and forestry for women

John Proffitt
Director, Division of Institutional and State Incentive Program
U.S. Department of Education
United States

I think that the two primary roles of government in the area of cooperative education are to initiate new programs and to stimulate programs which have already been developed. The United States government has done the latter. We did not create cooperative education or the cooperative education movement in this country. In fact we came into the role of stimulating, supporting and encouraging it rather late. Our role began with the Higher Education Act of 1965, which under Title 3, called Strengthening and Developing Institutions, included cooperative education as one of five options that institutions could elect in order to apply for federal funds to support their activities.

In the 1968 Amendments to the Higher Education Act of 1965, cooperative education was recategorized as a form of student assistance and placed in Part D of Title 4, which encompassed the Student Assistance Programs. This was important because how programs are categorized in legislation and how they are associated with other programs often has great bearing on how they are funded and administered.

The Education Amendments of 1972 again included cooperative education as part of Title 4, but for the first time with a specific line item authorizing the appropriation of funds for cooperative education.

The Education Amendments of 1976 significantly broadened the scope of the federal government's involvement in cooperative education by removing it from Title 4 and giving it its own separate status within the legislation under the new Title 8. Therefore cooperative education, as far as the federal funding support strategy was concerned, was no longer associated with student aid, and we think that this was a long overdue corrective step. Some of you may see this as government intrusion; we hope it is supportive and creative intrusion and will struggle to make it as flexible as possible.

The 1976 Amendment was also significant in that Congress and the Office of Education recognized the parallel pattern of cooperative education. This then legitimized the developments which had particularly taken place in the community college sector, in that funds could now flow to and support the parallel pattern programs in the community colleges. It also set up a declining five-year scale of federal support relative to administrative grants: 100% the first year in terms of federal contributions, 90% the second, 80%, 60% and finally 30% in the fifth year, with the very clear philosophical assumption that this was seed money to enable the institutions to initiate, strengthen and expand cooperative education programs, and that the institutions would make a commitment during this five year period to continue these programs without the long range soft support of federal funds.

Federal funding support has grown dramatically, though not as dramatically as we would have hoped. In the first three years it averaged approximately $1.6 million per year. Between 1970 and 1976, administration grants totalled $45 million. During this period a little over $3 million was awarded to institutions for research and training programs.

Concurrent with the growing dissatisfaction with higher education which developed in the late 1950's and 1960's, and the government's interest in cooperative education, the number of institutions offering cooperative education programs grew from 195 in 1970 to over 1,000 in 1976, and cooperative student enrollment showed a marked rise from 30,000 in 1970 to about 200,000 in 1976. Since the Johnson administration, in fact, the executive branch of the federal government has been keenly interested in cooperative education.

The Higher Education Act provides for four categories of grants. First there are administration projects, which are grants that generally focus on a single department or cluster of departments in order to help them develop and carry out cooperative education programs and strengthen and expand linkages with employers and local high school cooperative education programs. The grants provide for a maximum of $325,000 annually to institutions. In the case of a consortium it is $250,000 times the number of institutions in the consortium. Grants are for up to five years if the institution comes into the program new, and only for one year if the institution has already been in this program.

The second major category is demonstration projects, large grants to help institutions plan and initiate institution-wide cooperative education approaches for secondary programs of study. These provide for both comprehensive and special projects. Special projects can either explore the feasibility of new approaches to cooperative education or investigate new solutions to problems encountered by students, institutions or employers in the cooperative education arena. Comprehensive project grants can go up to $1 million and have a maximum three year duration. Those for special projects are for one year and are for much smaller amounts designed and tailored to the project involved. There is no matching requirement for the comprehensive programs; nevertheless the Department of Education expects that because of the very nature of the projects, institutions will make a commitment to provide some matching funds and also carry on in the long run.

The last two categories are training projects, which require no matching funds and are up to three years in duration, and research projects, one year in duration and needing no matching funds.

I want to emphasize that we in the Department of Education need certain things from you in the institutions if we are going to be your partner in helping to further the cause of cooperative education in the United States. Most particularly we need more and better data from you, hard core data if you will, as complete as possible as to the number of students participating in cooperative education programs, the number and identity of employers, the amount of money which your students are earning in the form of salaries and the amount which they are paying out in the form of state and federal taxes. I want to emphasize this because I firmly believe that Congress is going to ask us to present data such as this in our oversight hearings preparatory to the 1982 budget, and if you desire federal funding to continue at the present level of $23 million, or to expand, you must work the National Commission on Cooperative Education Association and help us pull this data together.

James R. Poole
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United States

I bring you greetings from the U.S. Office of Personnel Management in Washington, D.C. This Federal agency was known for almost 90 years as the U.S. Civil Service Commission. Its principal mission is to serve as the personnel management arm of the largest branch of our government, the Executive Branch.

I would like to review some highlights of almost four decades of the U.S. government's role as an employer in support of cooperative education/sandwich programs, and to discuss the views of the employer as a partner in this partnership between schools, students and employers. As each of you knows, each member of this partnership has a very important role in developing today's students to become tomorrow's leaders in government, business, industry and education.

Although we will celebrate the 75th anniversary of the founding of the cooperative education concept at the University of Cincinnati, we in government did not become a full and active partner until after World War II. It was at this time when our economy was shifting from the production of war materiels to the production of consumer goods and the expansion of aerospace exploration, atomic energy and other research and development missions that it became necessary for us to actively compete for college trained personnel in the physical and life sciences and engineering. This was true because all employers within our economy were seeking the same types of professionally trained talent. Our first venture with the cooperative education concept was known as "Student Trainee." Students participating in curricula leading to careers which at the time were considered to be in short supply for recruitment purposes, qualified in an open competitive examination. Those who performed well in these examinations and who were selected, received appointments within our Federal governmental agencies which permitted them to work when school was not in session. Initially, such periods of employment occurred during summer vacation periods and students had the opportunity to work each year until graduation. Those who performed well received career, civil service appointments and subsequent training which made them more proficient in the performance of responsibilities for which they had been selected as professionals. Let me hasten to point out that this was a matter of survival, if we were to attract competent young men and women. During these periods of short term employment, every effort was made to assure that students received progressively responsible assignments directly related to their educational goals. Quite frankly, our motive was selfish. If we provided the type of experience that offered challenge, we were able to retain these graduates even though our salary structures were less competitive. The essential ingredient at that time, which is the same as it is today, was to provide meaningful, challenging and productive experiences in an environment which would encourage students to become employees within government.

During the period 1946 to 1965, this is how we supported the concept of cooperative education and recruited individuals who remain with us today. In 1965, when we were engaged in armed conflict in Southeast Asia, many students elected not to take our examination under the Student Trainee concept. It was also at this time when employers in business and industry could offer higher salaries to professionally trained, talented young graduates. In recognition of this type of adverse impact, President Johnson issued an Executive Order which eliminated the need for students to compete in civil service examinations. Rather, those who performed satisfactorily during career related work assignments as part of their cooperative education curriculum, could be noncompetitively converted, that is, without taking a written test in order to receive a permanent appointment within the Federal government. This was an incentive, and the number of students participating started to rise. During the period of 1965 to 1969, such programs were limited to students enrolled in curricula leading toward careers deemed to be in shortage categories for recruitment purposes. However, during the latter part of the 1960's, there were several factors which in my opinion served as a catalyst for rapid growth in cooperative education programs. One involved student unrest on campuses during the late 1960's. It was during this period of time that the word "relevancy" became a keystone word on our campuses. Those of you involved at that time will recall students saying, "what you are teaching me is not relevant to what I need to know to become gainfully employed." It was also during this period when educators turned to look at programs being conducted in schools like Northeastern University, Drexel, University of Cincinnati and many more where such campus unrest seemed to be less severe. These schools as you know have actively participated in cooperative education for a number of years.

Another factor was the movement toward career education. This involved the exposure of students to the occupational horizons available to them by employers both public and private, and in turn assisted students in making some realistic decisions as to the type of careers they would like to follow into adulthood. The Federal government, as an employer, in response to this new wave of interest in off campus assignments, modified its program to authorize the employment of undergraduate students enrolled in general studies and liberal arts curricula. Another factor that played a key role was the rising cost of tuition and other educationally related expenses which caused students to explore more and more the "learn and earn" concept.

In 1969, there were fewer than 9 Federal government agencies which employed less than 1,000 students annually from less than 69 colleges and universities. During the next 5 or 6 years there was rapid and progressive growth. By 1971, there were 26 agencies which employed 1,757 new students and by 1975, over 6,000 students received their educationally related experiences within the Federal government. In recognition of this rather dramatic growth, there was a second presidential executive order which extended the noncompetitive conversion authorized to all students, not just to those enrolled in curricula leading to careers deemed to be in shortage categories for recruitment purposes.

The next significant development occurred in 1977 when the third presidential executive order authorized the Office of Personnel Management to expand cooperative education programs to include all academic levels from secondary schools to advance degree programs for doctoral candidates. Today the U.S. government employs in excess of 16,000 cooperative education students, making it the largest single employer of such students in the country. These students represent over 800 colleges and universities, and receive their duty assignments in all 50 states, the District of Columbia and Puerto Rico.

I would be remiss if I did not point out that we are just one of the many partners in this partnership. There are some 32,000 employers like us who feel that it is just good business to provide some relevancy in the relationships between educators and the need to train future leaders in those fields which are in the greatest demand in our society. It should also be recognized that there are professional organizations and associations which have played a major role in sponsoring this viable partnership between schools, students and employers.

Since my role here today is government as an employer, I will not comment on the role government has played through educational grants to encourage the development of cooperative education curricula on campuses throughout the country. This will be discussed by the representative of the Department of Education.

The breadth and sophisticatin of today's cooperative education programs in government have evolved in the past 35 years from experience and from this ever increasing requirement to recruit for a multiplicity of professional students. This has been necessary to protect the country's welfare to acquire a variety of talents needed to meet the expanding commitments to face contemporary social, economic, scientific, and national security challenges.

We do not have the power of "Genie" and therefore, are unable to predict future growth and development of the cooperative education program within government. But we can say without reservation, that our experience demonstrates that our membership as a partner in the cooperative education movement has just been plain good business. We expect continued participation and are planning to expand our efforts among secondary schools so that we may broaden the occupational outlook and horizons of youth in their early, formative years.

SESSION 10: DEVELOPING INTERNATIONAL EXCHANGE PROGRAMS

Maurice Hartley
Cook College of Rutgers University
United States

Perhaps I should note that Rutgers has, as do many of your institutions, a number of programs with an international thrust:

1. junior year abroad
2. foreign nationals as students (predominantly Orientals, Hispanics, and Africans)
3. curricular programs in social studies, humanities, languages, and international environmental studies
4. international agriculture and foods program (federally funded Title XII program involving exchange of faculty and students)
5. cooperative education (undergraduate and graduate, national and, more recently, international in scope).

My experience has been largely with the Cooperative Education Program. In seven years we have placed students in 27 states and six countries abroad. To be quite honest, we place less than 10 students yearly in international sites. Thus, like many of you, we are just beginning to understand and to deal with the multitude of difficulties and intricacies that comprise global education in general and international cooperative education in particular.

My objective is to share with you some of the things that we are learning in our own efforts to increase off-campus international and inter-cultural work-learning opportunities for our students. I address this objective with the understanding that cooperative education is one worthy program, but certainly not the only program which may be devised in a comprehensive approach to international education.

Because concern for global matters is an emerging rather than an established goal for educational systems, we have found no suitable, comprehensive, self-contained definition, description, or analysis of what global education is, how it differs from "studies of other countries," what its objectives should be, what things are most likely to assist in meeting those objectives, and so on.

While this is generally true for global education, it is especially so for international cooperative education. Simple, readily adaptable recipes are not available. One gut-level feeling, however, has been with us from the start: international cooperative education must be qualitatively more than simply getting a student a job in another country.

In fact, the tendency to use the word "other" is quite revealing. It implies divisiveness and connotes a "we-they" kind of thinking. Truly international/inter-cultural educational endeavors must stress the unity of humankind, or else we may simply promote nationalism and the further accumulation of information that remains void of understanding.

In my opinion, it is just this factor that best distinguishes most domestic cooperative education programs from those with an international/inter-cultural perspective: domestic cooperative programs, by design, have an inward orientation (i.e., the focus is on the various individual benefits for the student, the college, or the employer). At the international level it is critical that we transcend self--that we grow beyond independence to what I call responsible interdependence. Responsible interdependence means that, without loss of self, we experience the world as "community"; although opinions and lifestyles may differ, we recognize our inherent human needs and we learn to cooperate as we seek common goals. Domestic cooperative education programs often encourage students to establish objectives related to their personal needs, careers, and academic majors. Quality, international/inter-cultural programs, on the other hand, must initiate an outward orientation--a global perspective. This point will be illustrated when I describe the "Conestoga Connection."

While cooperative education in the United States enjoys a long and rich history, its emergence as a formal educational program is a relatively new phenomenon throughout the world. Yet the concept appears to be flourishing. Wanda Mosbacker's 1975 study, for example, revealed 56 countries with some form of cooperative education. However, as one might suspect, virtually all are designed to meet the educational and industrial needs of these countries through domestic placements.

The Allen and Brown 1978 survey of 1,030 known cooperative education institutions in the United States and Canada revealed only 54 institutions with current, active overseas placement programs. Two-thirds place less than 10 students per year. In short, there are a limited number of models for us to follow as we consider developing or expanding international cooperative education exchange programs. Where such programs do exist, one of three main approaches may be expected:

1. Reciprocal exchange arrangements between institutions of different countries. Students may be assigned for periods of work or a combination of work and study. The host schools arrange for placements, orientation, site visits, support services, evaluation, and perhaps even social events.

2. Establishment of a resident program director abroad. While this method offers some benefits, it is more expensive and probably should be considered only when a) there is a significant number of students involved, and b) there is a sure source of jobs and qualified students available.

3. Use of existing exchange programs. Examples here include: a) individual colleges such as Northeastern University and New Hampshire College, b) consortia such as the Pacific Northwest International/Inter-cultural Consortium, or c) a variety of organizations such as the Association for International Practical Training, the German Academic Exchange (DAAD), the International Agricultural Exchange Association, and various Kibbutz associations.

The establishment of an international component for your cooperative education program should not be approached naively, even when you plan to use existing placement services. It is not an easy task! You need at least the same high level commitment and institutional support that is required for success with a domestic program. Moreover, as suggested earlier, you may need to redefine your goals and objectives to incorporate a global perspective and avoid the "Conestoga Connection."

Donald Allen (1976), Director of Foreign Programs, Northeastern University, has outlined some steps in establishing an exchange program. Time does not permit me to elaborate, but I want to give you some feel for the breadth of factors which must be considered.

You must determine for which students and majors the program is being established and toward what country it is directed. Groundwork includes such things as selecting an institution or association with which to work and making contact with the various cultural affairs officers, ministers of education, and institutional representatives. You must determine the number of students to be served, the length of work-periods, the major and level of students, and living arrangements (e.g., with host school or with families). You must also develop orientation programs, consider language barriers or requirements, prepare to meet visa and work regulations, and last, but not least, make travel arrangements and consider problems related to insurance and liability.

A quality international/inter-cultural exchange program, like domestic programs, should be subject to defined, rigorous academic standards, controls, review and evaluation. Decisions must be made and strategies developed to insure that your goals and objectives are being met. This presupposes, of course, that you have determined your goals for establishing an international exchange program in the first place.

In closing, I call attention once again to the "Conestoga Connection." How many of you have heard of the Conestoga wagon? The Conestoga wagon was first built in the Conestoga Valley of Pennsylvania around 1755. It became the prototype of all future wagons used in pioneer days. The Conestoga wagon, also called the "prairie schooner" because of its large, ribbed canvas top and boat-like appearance, was known for its sturdiness, maneuverability, grace and beauty. It was constructed of well-seasoned wood such as swamp oak, ash, and gum. Its builders used hand-forged iron straps, nails, bolts, corner plates and pins. Its six-foot high rear wheels and four-foot high front wheels helped it meet the rugged challenges of the mountains and prairies.

Have you ever stopped to wonder why there are no Conestoga trains, trucks, boats or airplanes today? Perhaps it is because the builders of the Conestoga wagon, as ingenious as they were, thought only about wagons instead of about transportation. Cooperative education came into being in America when Dean Herman Schneider thought about community instead of the classroom. Our own thinking must expand to include "world" as community as we move internationally with cooperative education.

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Dagmar Scherp
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United States

I will speak on the subject of developing international exchange programs, how to involve business in them, and about our own series of programs. I will then expand somewhat by giving what I consider to be the basic guidelines for success in establishing these programs, and very briefly touch on the German model which can be used as a guide.

Given the international economic interdependence of companies, international cooperation really helps in terms of business, and for this reason business has a stake in the success of international cooperative programs. However, the institutions that develop these programs must do so with an awareness of what is happening in the economic environment. Therefore, for any partnership or any new program to involve business it must involve government, because government regulates work permits. It must also involve labor.

Any organization that wants to set up international exchange programs must work through institutions that are resident in the other country and help these institutions understand the necessity and the goals of these programs. Therefore, program initiatives in international cooperative education must revolve around the real needs that exist in the business environment. Young people need to be educated in areas for which there exists a need--the skilled labor area, the technical areas--as well as in the international management and financial areas.

International exchange programs have four basic goals: (1) to improve the individual participant's career opportunities in international business; (2) to provide business with individuals, especially young professionals, who have foreign work experience, speak another language and understand another culture; (3) to cultivate positive international relations and (4) to aid less developed countries by means of the transfer of know-how in the area of human resources. For these international programs to be successful they need: (1) the recognition and support of the government through official government agreements, (2) the support of business through the provision of internships and financial assistance, and (3) the help of non-profit organizations in organizing, developing and implementing the programs themselves.

The German model which was briefly mentioned this morning by Shirley Williams as being very successful really involves all of these factors. The Ministry of Economic Cooperation in Bonn directly sets aside quite a sizeable budget in order to bring in participants from the less developed countries, as well as to provide stipends for people who come from the industrialized countries. In addition, two non-profit organizations, the Society for Technical Cooperation and the Carl Duisberg Society, implement programs involving foreign participants and German participants going abroad in the technical area and the human resource development area. Government agreements exist between Germany and the individual countries. Local governments, in this case the states of Germany, work together very closely with business to provide organized, recognized internships so that foreign people can get work experience. Furthermore, the central agency for issuing work permits works closely with these organizations, and under the new agreement that was passed early this year Duisberg participants will get a work permit without having to go through the official bureaucratic channels. Business also lends support by allowing its people to participate in this exchange by giving them leaves of absence from their jobs so they can work with these non-profit organizations.

The Carl Duisberg Society has two foreign work experience models, depending on whether it is the developed or the developing nations that have the exchange with the industrialized ones. From the industrialized countries we accept young graduates in different professions who have completed their education and have some work experience which they could have gained through the cooperative modules of their career development. They study abroad for one semester, and depending on their need they concentrate either on the language of the other country or on a particular technical area. They work for a year and a half at an international firm or a local firm to gain work experience in the other country, and then they return home.

If the participants come to Germany from the developing countries, they first go through the language programs, then funding is made available for them to go through a whole career program and actually study their profession, which they did not have the opportunity to do in their native country. The work experience follows, and then they return home.

A new program is now being developed to bring them back after a few years of work experience in their own countries for refresher programs, in which they would be up-dated on the technological advances that have been made in the interim. The goal of these programs is to attract participants who are willing to take some risks. We are a facilitator that makes these programs possible, but we do not simply serve anything to the participants on a gold platter. For example, if we work with the developed countries, we arrange for the training visa so that participants can get work permits, and we arrange for the home-stay program so that they can live with families or go to the universities. Then we ask the participants to look for work themselves. They do get some help, but we do not provide the jobs for them. We want to attract young people who are willing to overcome some problems in order to survive in another culture, and who thereby gain the self-assurance that will make them the true ambassadors of international cooperation in the future.

The Carl Duisberg programs from Germany began in the 1920s and have been going on in a very organized fashion for the last 30 years. The former participants in countries all over the world are now the ones who provide the internships for the young people. So in effect the experience has snow-balled.

As far as funding is concerned, very often we can make stipends available for the study portion of the programs. So far all funding has come from Germany, in most cases from the German government, no matter what country the participants are from. We have not yet been able--and this is one of my goals in the United States--to establish cooperation with local agencies to obtain funding The rest of the funding comes from business in the form of the job opportunities for which the participants get paid. Some of the participants get paid very well depending on the job they perform, but in all cases they can live off of their earnings.

J. V. Reed
Senior Industrial Tutor, University of Surrey
United Kingdom

I have not heard much in the last two days about the quality of student placement, and since my responsibility as an industrial tutor is with the placement of students, I thought I would spend a little time talking about how we deal with this particular problem.

Ken Ryder said this morning in his keynote lecture that at one stage Northeastern discovered that their students were roaming the world. Well, I think that students have always roamed the world within the limits of their own packets, but I do not think that this has very much to do with cooperative education. Again, Shirley Williams this morning talked about British universities being rather conservative. I would like to take issue with her on that, particularly with respect to the nine or ten U.K. universities that run cooperative programs, because we do in fact have very wide international contacts. Our development over the last 20 years in international placement has been extremely rapid.

Speaking for my own institution, the University of Surrey has at any one time 700 students on placement, 100 of whom are out of the country on international placement. We place them abroad for a variety of reasons, but most of them have to go abroad because their courses combine science, technology or engineering with a foreign language. Our department of linguistics also sends its students abroad for linguistic perfection.

The placement is done within the faculty and within the department. We do not have a central organization for doing this; the contacts that we have made over the past 20 years have essentially been person-to-person. Most of the universities that I have mentioned, in fact, operate in this way. These contacts have come about by research, comparison of research, getting involved personally, visiting the company, exchanging staff, arranging mutually useful work and, if all goes well, exchanging students. This takes time. It is impossible to do these things by telephone.

One of the peculiar features of our scheme is that the students who carry out this work placement--one year away from the university and three years within the university--are assessed. We take a lot of trouble to make sure that a student works in a relevant situation and at a level which is commensurate with his ability. There is very close control of the work they do, tutors visit them regularly for the purposes of continuing assessment, the students' work is itself assessed within the university, and the professional supervisor in industry or in research further contributes to assessment. In my own institution these assessments lead in many cases to a separate award which is not assimilated with the degree.

It is becoming increasingly clear in the U.K. that our professional institutions, both in engineering and in other subjects, are taking a very strong interest in the training that is being provided for students before they become corporate members of an institution. We are trying to cooperate more and more with our professional institutions in order to provide the right kind of experience. This is why when a student goes abroad on a cooperative program it is important that what he does is relevant to his course and can be assessed. This is what costs money, and we in fact charge the student full fees for each of the four years that he is enrolled, even when he is out in industry for a year and earning a salary. The assessment will eventually be reported to his professional institution when he goes up for corporate membership.

We use other exchange schemes too, a number of which are with other universities on a reciprocal basis. We do this for many reasons. It is much easier than touring, establishing contacts and building up a long-term relationship. One exchange program is with Swinburne Institute in Melbourne and another is with Victoria University in British Columbia. We also have a new concept of a three-year exchange scheme in which the professional/industrial/training element is provided by the host institution.

It has been valuable to me to have had the confidence of a number of institutions over the years, particularly during the recent crisis when our steel works did not operate for six months. This threw a dozen students completely out of work. I was able to relocate them very quickly within other European steel works which were not as afflicted at that time. This was a result of having the sort of contacts that we have in Europe.

Mary Lynn Rector
Northeastern University
United States

In July of this year I will be running a workshop through the Center for Cooperative Education at Northeastern University, "Establishing International Work Experience Programs," which will go into detail on how to develop new programs from scratch. Later this afternoon some of my students who have worked overseas will be speaking about their experiences, which will serve as another presentation on the international student exchange program at Northeastern. Therefore I will present just a brief overview of how Northeastern entered the international area in the first place, together with several of the methods which I use for developing international exchange programs.

It is not immediately obvious how Northeastern became engaged in the international area, because it is actually a regional institution. To a large extent, we attract a local student population, people from the Greater Boston area. In fact, many of our students are commuters from working class neighborhoods, not those who you would normally think would go in for the grand tour of Europe.

It is not an Ivy League university, obviously; it is a professionally oriented institution. Our strengths at Northeastern are business, engineering, and the medical-related professions. We have not developed international programs in the traditional way, i.e. study abroad programs in the liberal arts. Our calendar in itself is limiting; after the freshman year, our students do not have the summer off; they are on cooperative work assignments or at Northeastern, and hence do not have the opportunity, unless they take a leave of absence, to go overseas.

So, given these factors, how did we become involved? One reason is that our previous president, Asa Knowles, undertook a very ambitious project called "The Encyclopedia of International Higher Education." Some of you may be familiar with it; in fact, there are some contributors to this encyclopedia here at the conference. In putting it together, Dr. Knowles contacted people from all over the world and many of these people still maintain contact with Northeastern; they include not only representatives of institutions of higher learning, but also ministers of education from governments around the world. Because Northeastern is well known for cooperative education, we do receive a lot of visitors from overseas on campus. Usually about twice a week visitors come through, often from very diverse countries. Just recently, for example, we had one from Nepal and one from Argentina. Often these people maintain contact over a number of years. I have met quite a few people at the conference who have said, "Oh, yes, I was up at Northeastern three years ago," and you find out that they are from Australia or Nigeria. So this is another way that we have entered the international area. The Chinese are an example; they sent a delegation to the U.S., which came to Northeastern, and then Northeastern reciprocated, sending a delegation of 20 faculty and administrators to the Republic of China in 1980. We now have 20 Chinese exchange students on campus, five of whom have just started their first cooperative assignment in Boston companies.

Our employers are a third factor. Northeastern has 2,500 employers in the Greater Boston area, many of which are multi-nationals with overseas operations. Also, many of them were once Northeastern students, who have found themselves at various times working overseas, and who therefore come back with an enthusiasm for bringing the same opportunities to our current students. People start dreaming and sometimes their dreams become reality.

Fourth, we now have 2,400 foreign students at Northeastern from 95 countries. So our international population is ever present with a world-wide alumni network.

Finally, a large percentage of our faculty were either born overseas or have lived, worked or studied there. These people, when they came to Northeastern, looked around for some way to establish connections with the country they had left. They realized that this had to be done by establishing a model at Northeastern which was appropriate to this institution, but yet which still incorporated the international experience. For instance, my predecessor, Don Allen, was originally from the history department and had done much of his doctoral research in France. I myself completed a Master's at the University of Sussex in England and taught in England for eight years.

So people like us have come to Northeastern, and we have then thought that because our overseas experience has been so valuable for us, there might be some way to bring it to our students. And so we started various exchange programs. To be quite honest with you, some of them we started first and then we asked afterwards: what are the goals and what are we really trying to achieve? There is a fair amount of trial and error involved. On paper it all looks like a very well planned out, well paved road, but this is not always the case. To be brief, I will give you three of the types of programs we have developed, those that seem to be working at the moment, anyway.

The first program is the largest: the direct exchange relationships with an overseas institution. These are fairly informal agreements that we have with institutions. For example, after the talk I gave yesterday, someone from Australia came up and said, "Would you like to try exchanging a few students?" And I said, "All right." And he said, "Well, how about two? Shall we start with two?" And I said, "OK, that sounds good. What major?" So it is very informal, almost like a game. Exchanges usually start that way and we see, very pragmatically, how it works, and if we can work with the person, if the placements are easy or difficult; and then we try to expand on them. Although this type of agreement is fairly informal, we have tried to compensate for it by developing a fairly formal application and selection process. In fact, our application process is really designed as a hurdle to weed out people.

The second model is a fairly formal agreement, such as the one we formed last year with the University of Waterloo. This is a full sister institution agreement. We had to go through the Canadian and U.S. governments in order to be able to obtain work permits; but usually only when it seems to be necessary to go through the government of the country do we need to be this formal.

A third model that we have is the direct exchange with industries or organizations. As I have mentioned, we have one professor in the medical technology department who is Swedish, and she has set up a program in Sweden to exchange medical technologists. This program has been very successful. We are exchanging about eight students a year now with Sweden. So this is another model: accepting trainees in exchange for students, which demonstrates that you should not forget the resources on your own campus before you start looking outside.

SESSION 11: SPONSORED EXPERIENTIAL EDUCATION: AN INTERNATIONAL PERSPECTIVE

Keith Nixon
Mohawk College of Applied Arts and Technology
Canada

I am going to talk from an engineering base, about very pragmatic vocational-type education. Mohawk College was the first college, not university, in Ontario to adopt cooperative education some 13 years ago, and we feel that experiential learning is going to be our salvation. I feel that cooperative education is an extension of the academic aspects of programs. Now one of the problems we faced in Ontario, and I suspect you are now facing in the States with Proposition 13, is a shortage of capital both for equipment and to articulate the type of skills you want to develop in an academic situation. What we in Ontario tried to do is to mold industry and education together. I understand that this is something which in Europe has never really been heard of too much. In Ontario we have come up with a new initiative called Community Industry Training Advisory Councils. These are community-based organizations of interested business, labor and education officials who will actually try and bring a coordinated, cohesive approach to training and education in order to meet the needs of industry. This is a totally different philosophy than taking the individual and designing a training program for that individual's self-fulfillment. We are trying to find somebody to fit our training program.

Another situation that we will be facing in Canada is a real shortage of people in the high technology skilled occupations. Our forecast just for the Hamilton/Toronto area is 50,000 skilled tradespeople short by 1985. In high technology, 75% of all the occupations that we will have to fill through the '80s will require some scientific base, so again we have to look to a vocational level to fill this particular type of need. Also, we want to be able to allow people to gain not just sponsored experiential learning but credit for prior learning, and this is something that we feel is extremely important. We are going to have a shortage of people coming from the traditional high school setting, and we want to attract adult learners. The only way we can do this is by setting up some sort of assessment mechanism for people in the 30, 40 and 50 age limit. We just finished a program last September with seven individuals, the oldest person being 62 years of age. We put them through what was normally a four-year training program in two months by giving them credit for up to 45 years of industrial experience. I do not agree with institutions that set arbitrary levels of prior learning credits. I believe you should have credit for what you have achieved. That is the direction that we are working in.

The other thing that we are trying to look at is a continuum of learning. This particular continuum goes from the semi-skilled worker in an engineering setting right through to the professional engineer and scientist. One of the problems with a time-based system is that people generally have to start back at square one and complete year one, year two, year three, then go on to the next program and complete year one, year two, year three, etc. We are looking for prior learning credits and a hierarchy of competencies that will go right from square one through the extent of the discipline. We realize that people will move across a number of careers during their lifetime, and there should be a way for those people to gain additional competencies who have to increase their skills. We want to identify the competencies that people need and then develop these skills completely through

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the continuum, so that when somebody wants to move from one sphere to the next we have a bank of competencies that can be gained in a sponsored, experiential cooperative setting. This is the model, and it is a highly structured one.

Sheila Gordon
LaGuardia Community College
United States

It seems to me that the primary form and objective of cooperative education in the United States today is a paid, alternating work experience that is part of an organized educational institution. There are lots of different ripples emerging, and I think that they are terribly important. I was thinking too, as an historian of American education, about the way Americans solve problems. For example, if you have a hundred thousand deaths on the highways each year, how do we solve that? We do not take away people's licenses; we develop driver education and send our 16 year olds to learn in a classroom situation how to drive a car. In short, we solve our problems with courses.

Now there are many cultural contradictions in American society. The work ethic goes very deep. We have always believed that everybody should work and pull him or herself up by their bootstraps.

In terms of formal schooling, a heavy academic emphasis has persisted. But around 1960 cooperative education really took off in this country. The economy was very hot, a lot of money was being put into technology, and there was a tremendous need for engineers and technically-trained people. Companies were demanding them, and would take them on a cooperative alternating basis as well as other ways. It was really the companies, the employers, who wanted cooperative education. I would argue, therefore, that the impetus for cooperative education to grow in the United States was economic, not social or educational. It would seem that in parts of Africa where it is emerging the impetus is social, to try to get certain kinds of social change.

Cooperative education took hold, and there are now some 1,100 colleges and universities which have cooperative education in the United States. But today the economy is sluggish, and we are now asking ourselves some very profound questions, such as: What are we educating people for? This has led cooperative education to take a different kind of role.

Today we cannot use cooperative education solely as a way to reinforce and deepen certain technical learning that we have given students in the classroom. We have to use it for the broader purpose of helping our students to clarify their values, to anticipate leisure and extra-curricular concerns, to develop at home their personal skills, and as a way finally to figure out the difference between their job and their life work, which do not necessarily have to be one and the same thing. We have the big problem of helping the people who come to college figure out how they are going to deal with a society in which we are not going to have an economic boom, in which we all may not be employed, and in which we certainly are not going to have our life's work entirely be that for which we are paid. I believe that cooperative education can be a vehicle for that. My institution and many of the other institutions in the United States are beginning to shift away from an emphasis on a direct relationship between one's major and what one does on one's cooperative work experience, toward a much broader and more general educational concern.

Norman Evans
Cambridge Institute of Education
United Kingdom

This whole concept of theory and practice as an educational mode has to move outside the narrow professional confines where it tends to be at the moment in English sandwich courses. If we really take seriously the comments about employers becoming educators because they have no choice in the matter, because other people are not giving them the products they want, than one has to look at the possibilities inside cooperative education as a way of coming to terms with the problem to some extent.

But there is another curriculum implication in higher education which seems to be of paramount importance, and that is the overemphasis on the cognitive and the underemphasis on the effective. Increasingly, young people do not see the point of spending three years to get a degree. What do they have to look forward to? A postponed unemployment as opposed to a job they might have had when they were 18? Cooperative education is a recruiter because it offers the possibility of a liberal education plus career education and the opportunity for developing some live skills. So in these terms it seems quite clear that cooperative education is likely to be a winner.

It is also beginning to be evident that a relatively small number of students go through this sort of program in England. Employers see these students as more employable than others, not because they can go out and do whatever the employer actually wants, but because they have some experience of being able to assess themselves alongside the kind of work requirements which they find. The damaging accusation which can be made of so many academic courses in my country is that on the whole students are not given any systematic preparation for that at all. This is the kind of integration which is possible within cooperative education and has so much to commend it.

SESSION 12: OPERATIONAL MODELS: BUSINESS ADMINISTRATION

N. V. Anthony
Dean, Faculty of Business
Royal Melbourne Institute of Technology
Australia

The Royal Melbourne Institute of Technology (R.M.I.T.) is a large, multidiscipline college with a total student population of about 30,000. Of its six faculties--business, engineering, applied science, art, architecture and humanities, and social sciences--only the faculty of business conducts cooperative education programs. The specific courses lead to Bachelors of Business in accounting, public administration, local government and transport. Each course is conducted on the thick sandwich basis, which is two full-time academic years followed by one year in industry, then a final full-time academic year.

While one or two colleges in Australia have flirted with cooperative education programs in business, R.M.I.T. is the only college that has maintained a compulsory segment in industry for full-time undergraduate students. Our courses, therefore, are four years in duration compared with three-year undergraduate business courses at other colleges and universities, and they are eagerly sought by prospective students. The Bachelor of Business (Accountancy) commenced in 1971, and now 95-110 students are placed annually. For the other three courses which started subsequently, 40-50 students are placed annually in relevant positions.

The initiative for the establishment of cooperative education courses at R.M.I.T. came from the staff of the faculty. We observed various models of cooperative education in the U.S. and the U.K. and opted for the thick sandwich model because it best suited the professions we service and minimized the administrative load.

Each course has an advisory committee comprising staff involved in the course and a greater number of external professional members such as accountants from chartered firms, industry, commerce and government. The education program is initiated by the academic staff and agreed to by the advisory committee before faculty approval is given. Changes in the education program have arisen from the requirements of the cooperative education year. In the accountancy degree program, for example, the subject of auditing was placed in the second full-time academic year (prior to the year in industry) instead of in the final academic year to allow students to gain skills relevant to their work program. Generally, we have attempted to design educational programs which lead from the knowledge of technical processes and skills to the understanding of concepts. Involvement in the cooperative education program has strengthened our views of the design of courses.

As a result of my observations at Ealing Technical College in London when the Bachelor of Business (Accountancy) course was introduced, I attempted to ensure that a student gained a wide knowledge of a firm's activities during his or her placement, including on-the-job experience in other functional areas such as marketing, production and personnel. I soon found it counter-productive to be too prescriptive for the work program; some industrial concerns rejected the proposal to place students, and chartered accountancy firms offered their own program to graduate recruits. Now the capacity of the employer, the requirements of the faculty and the talents of the students are all considered in developing an individual work program for each student. For chartered accountancy firms, the commitment of employers to the scheme and their on-going involvement has led to a situation where they have almost full responsibility for the program. For other areas such as transport and management accounting, the approach has been to discuss the broad parameters of the work program with employers and to gain agreement to them before determining individual work programs.

For example, the parameters for the transport course are that work should be relevant to the course and the future careers of the students, i.e. it should be transport oriented, enable students to build on some of the skills already acquired in the course, and provide insight into aspects of work relevant for subjects to be studied in the final year. The work program should be varied in order to gain maximum insight into the operation of the organization, and the program should involve some analytical work requiring student initiative rather than all routine clerical processing. The employers then develop a detailed work program and clear it with the academic staff. Employers with highly developed training programs can provide a detailed 12-month plan. Others may plan for a shorter period, and these obviously require closer liaison. We do not object to students being used to relieve work pressures at periods of peak load or being used on special projects, as both students and employers can gain by the deployment of students on these tasks. Refinements in the work program may be initiated by the employer or the student. As a result of the feedback gained from close consultation with employers, some shift in program parameters may occur in the individual courses.

One major reason why the cooperative education program is unique to the faculty of business at R.M.I.T. is that faculties of business in Australia are traditionally funded less generously than the hard core technologies of engineering and applied science. Introduction of such cooperative education courses required a dedication of the staff concerned and the sacrifice of other activities to allow the cost of the program to be met. I have tried to sell the concept of cooperative education to other business faculties in educational institutions in Victoria, and I admitted to the time, effort and costs involved. The perceived disadvantages have outwieghed the potential benefits in the view of those institutions and none have followed our lead.

Acceptance by employers, however, together with the demand for the courses offered has been the most gratifying result of our ten-year experience in cooperative education. When the scheme commenced, employers took students for altruistic reasons, as R.M.I.T. had produced graduates for the professions for many years. But even though employers are now faced with tighter economic conditions, the number of students being placed and the number an individual employer may take is increasing. One reason is that the employers get a good value for their money in that a student is productive during his year in industry. For many firms, the only certain way of recruiting an R.M.I.T. graduate is to build the cooperative education program into their recruitment schemes. As an indication of the continuing support of employers of accountancy students, 95% of those employers accepting students in 1979 continued their support in 1980, compared to a continuing support of 50% between 1975 and 1976. Other indications of acceptance by employers are a willingness on their part to participate in open days for students, seminars, guest lecturing, course advisory committees and social functions. The involvement of employers, including supervisory personnel and senior management in these activities, has been extraordinary. This is not due to chance but is the direct result of the energy and talent of staff in contacting employers and selling the course. Many employers now approach us in order to get involved in the program.

Most impediments in terms of employer involvement, staff commitment and student acceptance occur before a program is introduced. Now that each of our courses has been conducted for at least four years, many of these obstacles that might affect their viability or effectiveness have been resolved. However, each course still has its own problems, and attention is being given to minimizing those, as indicated below.

Bachelor of Business (Accountancy)

(i) Funding. The administration of the year in industry is undertaken by an administration officer (about 50% of his/her time) and an academic, titled the Director of Cooperative Education (about 1/3 of his/her time). The task, given the student population, is heavy. For example, each student may apply to each employer for placement, and the organization of open days, simulated interviews, as well as the normal routine tasks such as administration of industrial tutoring justify the appointment of one full-time person whose sole responsibility is the cooperative education program. We survive now, but we have not allocated the resources for undertaking higher level tasks such as research into employer needs, student satisfactions, the quality of work programs and establishing closer ties with employers.

At R.M.I.T., funding of faculties has changed recently from a centralized system to a decentralized, one-line allocation. The faculty now has the autonomy to allocate funds within fairly stringent guidelines, and it is a high priority that a full-time position be established and that the program is adequately supported financially.

(ii) Quality of Programs. The program for chartered accountancy firms is running smoothly, but public service departments seem to suffer the stereotyped faults of the bureaucracy--conservatism and adherence to rigid hierarchical roles--and the work programs tend to exhibit too high a level of routine clerical tasks. The solution is to expend time and effort in persuading departmental heads to meet our parameters.

Bachelor of Business (Transport)

(i) Placement.

(a) Small number of students for placement.

(b) Difficulty of placing foreign students on short-term visas, especially where their ability to communicate effectively is limited. It appears that many employers see the sandwich year as a proving ground in which to view potential permanent employees, and foreign students fit uneasily into this framework. To overcome this problem an attempt is being made to get more employers involved who have international operations, especially in Southeast Asia. Furthermore, we are trying to get some overseas firms involved so that the sandwich year can be more readily completed out of Australia. These students may be required to undertake a program to improve their ability to communicate effectively.

(c) Poor ability of many students to apply effectively for jobs or present themselves at their best in an interview. This is being overcome by an orientation program which provides skills in writing applications and gives experience in simulated interviews and role-playing to improve interview skills.

(ii) Present reliance on commercial firms for places. Due to competitive pressures, these firms often find it hard to plan well ahead to offer and accept places. There is a need to develop closer ties with government/semi-government bodies with the aim of broadening the type and increasing the number of placement opportunities.

(iii) Knowledge of course and its relevance. This arises mainly from the lack of a well-developed professional body in the discipline with strong educational aims. We need, therefore, to develop closer ties with industry groups like the Chartered Institute of Transport to influence and develop their educational programs and consequently their involvement in cooperative education.

Bachelor of Business (Local Government)

No major obstacles have been encountered. One problem is the level of remuneration, recommended at $5,200 by the Municipal Association of Victoria. Some municipal councils pay in excess of this amount, up to $9,500. This gap causes some resentment among students and is a problem yet to be resolved.

We believe that cooperative education programs undeniably lead to the more effective use of human resources, particularly for the students involved but also for the employers and academic staff. By providing a student with a breadth of vocational experience the program allows him to more readily choose a relevant job upon graduation and to be more productive in that job. By helping students to achieve further maturity and personal growth, the program makes graduates more attractive to employers.

Cooperative education students, unlike those who have undertaken academic studies only, are better able to relate theoretical ideas and techniques to practical situations. This is critical in the professions we service, where many employers put great emphasis on selecting employees with practical experience. Employers gain too because courses are more directly related to their needs. Furthermore, we have found that in some areas cooperative education has stimulated the interest of employers in in-house and wider professional training and continuing education.

As educators, the programs keep us in touch with the work sectors, their current developments and attitudes, and the level of competence they seek in new employees. As a result, we can adjust our programs and policies accordingly.

The courses at R.M.I.T., which include a one-year segment in industrial experience for full-time students, are uniquely different from business courses in Australia traditionally conducted in modes other than cooperative education. That the courses have been conducted successfully despite no greater funding than business schools offering the traditional courses is an indication of the staff's dedication to ensuring that the courses were implemented, and the commitment of many others in maintaining and developing those courses. It reflects the demand for graduates by employers whose interest is not merely altruistic but includes a large measure of self-interest, the demand for places in these courses by potential students, and the increasing quality of students selected. Given a flexible approach, hard work, and an adequate level of funding, we believe that the already high demand for our graduates will continue to rise. Cooperative education will undoubtedly remain an integral part of our courses.

Gilles Joncas
Director, Cooperative Education, University of Sherbrooke
Canada

The University of Sherbrooke was founded and incorporated as a degree-granting institution in 1954, and offers undergraduate and graduate courses in administration, arts, education, engineering, law, medicine, physical education, science and technology. It is a private institution, though heavily subsidized by the Government of the Province of Quebec. Its full-time enrollment is 6,700 students.

The M.B.A. Program was established in 1966 after a market survey conducted among large private corporations, government organizations and business and financial enterprises revealed a genuine interest and a willingness to participate in the program. It was a work-study program from its inception, modeled partly on the University of Columbia's post-graduate business training, and was the first professional course in business management in Quebec.

The aim of the program is to prepare future managers, to instill in its participants concepts which will help them acquire the competence necessary to solve present and future problems, and to train generalists sufficiently flexible to work in all kinds of organizations and conversant with the various aspects of business administration. More specifically, the program attempts to give participants a knowledge of modern management tools and an understanding of the true functioning of organizations, while at the same time developing the managerial and innovative attitude which will allow them to become efficient managers or entrepreneurs. Obviously, many facets of this training cannot be taught in the classroom but can be learned only through direct on-the-job experience with professionals already successful in the field.

The objectives require a flexibility in which two dimensions can be recognized: mobility and polyvalence. A generalist training allows our graduates to adapt to different types of organizations and to apply management techniques. The program also offers specializations in finance, marketing or management.

The responsibility for managing the work-term portion of the cooperative programs rests with the Department of Coordination and entails the necessary arrangements for the integration of the work terms, the securing of potential employers of the students, the arranging of interviews and the management of the employment aspect in general. Coordinators refer to the field personnel who supply the liaison between employers, students and the university. Coordinators have on-campus duties such as interviewing students and assisting with the employer interviews, in addition to their activities in the field. These activities in their assigned territories include: calling on potential employers; visiting current employers and discussing the work of the student, the return of the student for another work term, and participation in the next set of employer interviews; and visiting students on the job and discussing their progress, intentions for the next term and problems where professional counseling is indicated. We strongly believe that coordinators should have their educational background and vocational experience in the same field as the students they are placing and counseling so that they will be familiar with potential career opportunities and can more effectively evaluate the cooperative assignments. For these reasons, the coordinator for the M.B.A. Program is not a faculty member but an M.B.A. with a minimum of three years' experience.

The Admission Committee, made up of the Program Director, two faculty members and the coordinator, rejects those applicants who do not meet the basic admission requirements of a university degree and a minimum of two years' experience, and interviews all the other applicants. It examines each application in relation to the multi-disciplinary class to be formed, and bases its selections on age and group criteria. The group criteria are: age, academic background (type, grades), and work experience (type, diversity). The individual criteria are: maturity, leadership, aptitude to work with others, initiative, reaction to stress, and motivation and expectations. The average student admitted to the program is 27 years old, has two to three years of work experience and is a graduate in engineering, science, law, administration or liberal arts.

The cooperative M.B.A. Program is mandatory and operates throughout the year on the basis of three terms: Fall, September-December; Winter, January-April; and Summer, May-August. The program requires 28 months of training, including four terms of study and three terms of employment. The work-study sequence provides continuity in the supply of students to fill cooperative jobs on a year-round basis. It also generates a fairly even academic load in each of the three terms.

When an employer decides to enter the cooperative M.B.A. Program, he is invited to participate in interviews with students who are seeking work assignments for the next term. The first step in this process is the completion of an interview form which indicates the number and level of students required, and gives a description of the work in which they will be employed. Students examine these job descriptions and apply for up to eight interview appointments, selecting opportunities that offer the types of experience they are seeking.

Histories of candidates to be interviewed, providing information on academic marks and employer evaluations obtained in previous work terms, are sent to employers, who can interview all applicants or a selection of them. In the first 30-minute period of the interview, employers conduct a general introductory session to give applicants information on operations, policies and broad aspects of the job. Individual interviews of usually 30 minutes follow, in which the employer assesses the applicant, and details such as salary usually are discussed.

After the individual interviews are completed, the employer ranks, in order of preference, all the students who are acceptable for the job. Students also rank the employers with whom they have had interviews. These two sets of choices are combined through a computer program to effect the best possible match of students and employers. Although the Department of Coordination makes every effort to place these students and satisfy the requirements of employers where the best interests of each can be served, it is inevitable that some students will not secure jobs and some employers will not obtain students through the above procedure.

In keeping with the philosophy of cooperative education, the work term experience should complement knowledge acquired in the classroom. In order to achieve this, students should be engaged in jobs that involve a progression with respect to the skills required and the responsibilities accepted.

Very few students find fulfillment in their career goals with only one employer, and the majority wish to gain experience with two or more different companies. Therefore, while the Department of Coordination requires undergraduate cooperative education students to stay for two consecutive work terms with a given employer, no such rule exists for graduate students.

Satisfactory completion of the three work terms is a condition of graduation for the M.B.A. Program. Therefore, the Department of Coordination must have evidence of satisfactory performance for each work term in order to allow a student to continue in the program; unsatisfactory work performance means suspension from the program. Student performance is assessed towards the end of the work term. The employer is asked to select and to give ratings of the following specific characteristics most closely related to the student's performance:

-leadership
-professional knowledge
-communication skills, written and oral

-ability to apply practical solutions to problems
-ability to relate to others, to be part of a team
-original and creative thinking in tackling problems
-ability to adjust to various situations
-interest in work assignments
-diligence and industry in performing tasks
-analytical skill in resolving problems
-decision-making ability
-willingness to accept responsibilities
-effectiveness in preparing and executing work
-volume of work produced
-quality of work produced

Ratings can be excellent, very good, good or poor.

Several differences exist between graduate and undergraduate cooperative education. The average M.B.A. student is a university graduate with at least two years of experience and possibly with family responsibilities, who has decided to give his career a definite orientation towards management. His objectives are well-defined. The undergraduate student has little or no practical experience.

M.B.A. students have staff jobs which require essentially analytical work, such as a study that has to be made or problems that have to be solved. Very seldom do we see an M.B.A. student involved in a line job. Undergraduate students, on the other hand, are involved mostly in vocational training as part of a comprehensive program set up by participating companies. These are line jobs and are part of the normal, daily operations of the company.

Wage rates are competitive and the marketplace determines the levels. Flexibility is the rule at the graduate level because of the various backgrounds of the students, whereas fixed rates are the rule at the undergraduate level. Surveys are conducted and published each term on the basis of the coordinators' discussions with students and employers. This year the average monthly earnings for an M.B.A. student was $1500 per month; for the first work-term undergraduate engineer it was $950.

In a graduate program you need to establish a solid base of cooperation with the large corporations because they are your most faithful clients, whereas the small and medium-size companies have a much more erratic participation. This is true to a lesser extent in an undergraduate cooperative education program. Therefore, through the years we have built up a network of 300 companies, public and private, large and small, which we invite three times a year to participate in the forthcoming interviews for the purpose of securing a cooperative education student. Out of those 300 invitations we will get about 60 job descriptions for the 30 to 35 students we have to place.

Two remarks should be made about those figures. Firstly, you need a large network of companies to get a given number of job descriptions at the graduate level. For the M.B.A. the ratio is 5 to 1; in most of our undergraduate programs the ratio is 3 to 1. Secondly, the ratio of job descriptions per student to place has to be higher at the graduate level compared to the undergraduate level. It has been our experience that to place everybody satisfactorily we need a ratio of 1.8 to 2.0 jobs per student at the graduate level. To attain the same degree of satisfaction at the undergraduate level we need a ratio of 1.2 jobs per student.

The success of this new cooperative approach to business education was due to the support of faculty members, the higher authorities of the University of Sherbrooke, the appreciation and acceptance of the additional requirements of cooperative education by the students and most assuredly to the enthusiastic participation of many employer organizations.

SESSION 13: STUDENT PANEL ON WORK EXCHANGES

Ken Gerlach
Northeastern University, co-op in Germany

My first six to eight weeks of work in Germany involved an intensive training period in which I did a large amount of reading and research in the electronic-digital computer area. Later on, when I was acquainted with the material, I was very much involved with the project that my colleagues were developing.

My relationship with my colleagues was fantastic, so it made my stay much more enjoyable. They were very much concerned with what I was learning from my cooperative work assignment. Because they work in the computer field, English is a very important language to them, so this gave me an opportunity to teach them something as well. Of course, our friendship did not stop outside of the office. We occasionally got together after work, whether it was just in a local gasthaus or for a dinner party. One afternoon we spent several hours at the Oktoberfest, which made me realize how much Germans really appreciate their beer.

My working hours were quite flexible, so I was able to travel to Salzburg, Paris, Vienna and many other cities. One very memorable experience was a week I spent in Berlin. This was a trip offered to foreign co-op students by an organization subsidized by the German government. The contrast between East Berlin, the communist sector, and West Berlin is just fascinating.

Through my travels I was able to meet many people of various ages and from different cultures, and I learned more about my country through them then I had learned living here for most of my life. I can recall one trip during which I was speaking with a woman on a train in West Germany. This woman was 65 years old and had spent the first 64 years of her life in East Germany. She experienced the transition of Germany from a united country to a sectored country, and I feel that I gained so much from listening to the stories that she told me.

Finally, I think that if you listen to us students on this panel individually you can get an overall view of what a student can really experience from working overseas in any foreign land. I would like to close by quoting a comment that I made on my job evaluation form for Northeastern. "My decision to work abroad in a foreign country is one which I will never regret. I gained so much from it personally and professionally."

Susan Quinn
Northeastern University, co-op in England

I worked in London at the Midland Bank during my cooperative work experience. The banking business in Britain is completely different from that in the United States. In the States there are relatively small banks that cover small geographical areas, whereas in Britain two or three very large banks cover the whole area and most of Europe as well. So because of the few number of banks, there is a far greater deal of competition for market share than there is here. I worked in the Competitor Information division of the Marketing Department, and it was our job to follow what all of our competition was doing both in London and abroad. We did research on the English, French, Japanese and U.S. banks, and it was actually an ideal position for me because I had a great deal of interest in finance in general although I had never really studied the banking industry.

Because of the research that we did, I saw the differences between different countries' banking industries and it really fine-tuned my interest.

However, the experience was not without its problems. The differences between the British and American versions of the English language are so startling that there were often breakdowns in communications. For example, one day I made my co-workers nauseous when I mentioned that one American staple food is a peanut butter and jelly sandwich. However, jelly to them is what we call gelatin, so you can imagine what they thought of a peanut butter and jello sandwich. In another instance, my co-workers were talking about the exceptional smog that was around London then, and they blamed it on Mount St. Helens, saying to me, "If it weren't for your volcano."

I think that what I learned the most by the end of the six-month stay was a question of perspective. To exemplify this, I was once having tea with an English girl who was talking about something which she needed to illustrate with a map of the world, so she drew a circle and drew this massive lump in the middle and then little lines around it. I looked at her and asked, "What is that?", and she replied, "That is the U.K." I think that the only people who ever draw the United Kingdom on maps either have a good knowledge of geography or else they are specifically pointing out something in the U.K. If I were to draw a map of the world it would be a circle, and then I would start out by drawing Canada and would go down to the U.S. and then to South America. This incident made me realize that her view of the world and my view of the world are so entirly different because of how and where we were brought up. Because of my experiences in the U.K., I feel that I am more able to, if not see everything from another view, at least realize that there is another view, and for that I am very grateful. Overall, it is an experience that I will never regret, and I am glad that I was able to have the opportunity to do it.

Paul Bruck
Polytechnic of Wales, co-op in United States

I graduated from the Polytechnic of Wales in May, 1980 with an honors degree in civil engineering, and about a week later I arrived in Boston for my first work experience in the United States.

I now work as a structural engineer for Earthquake Engineering Systems, and that company is based in San Francisco as you would expect with a name like that. Of their 300 employees, 150 are based in Boston in their largest office. Here in the northeast the only reason to worry about earthquakes concerns the sites of nuclear power plants; we must consider the seismic qualification of nuclear power plants.

My first assignment for the company was at Vermont Yankee nuclear power plant, where we collected information on piping systems, something completely new to me. I tried to have an open mind about what I was seeing and learning, but there was not much technical challenge for me. That was a negative aspect about that particular experience. On previous work assignments in Britain I was given much more challenging work, even though I was not a graduate at the time.

One of the advantages of working there was that as a small team of only six people we not only worked together but we also socialized together. It was very easy to make friends, and we did a lot of activities different from those I was used to. Since we were in Vermont we did a lot of hiking, and we also played softball, which was something new to me since I was brought up with cricket. We also spent our summer evenings having cookouts, and in general we had a good time.

Some of the benefits that the company offered me included a complete expense account and the use of a company car, something I had never had before. The use of the car was ideal for somebody new to a country because it allowed me to go off on weekends to see new things, so I felt very good about the benefits that I was given.

After spending seven or eight months in Vermont, I returned to the Boston office to work on the analysis on the information we had obtained. The work certainly became much more challenging, with a lot more computer applications, and I learned things about seismic analysis that I am sure I would not have learned in my own country.

Concluding my experiences, it has been an extremely valuable experience for me professionally because I have gained something I would not have gained in Great Britain, and that is in keeping with the idea of the program, which is to go to a country and gain something that you could not have gained in your own country. In terms of personal growth I have also gained a lot, as I think anybody would who goes to another country and experiences different people with different ideas. One great cultural difference between the U.S. and the U.K. is that people here seem much more "workaholic". I have found it much more difficult to get time off for vacation here than in Britain. Personally, perhaps I could have gained more from the experience if I had been located in a smaller community where I could have gotten more involved with the community and in the American way of life.

I am very confident about what I do at work, but I feel that I would have reservations about going to another country and looking for another job all over again, whereas I would return to Britain very confident that I would get any job within my field.

Carole King
Northeastern University, co-op in France

My own work experience was in Paris, France. I worked in l'Ecole Superieure des Ingenieurs, an electrical engineering college, as a teacher of English as a foreign language. The students in this college prepare for careers as international electronics engineers, and since it is one of the school's basic beliefs that no one's education has been complete until they have been abroad, that is a requirement for graduation, as is fluency in English. We concentrated not just on English grammar but on communication for group problem-solving activities, which is important in engineering.

As for myself, I had studied English and journalism at Northeastern and had some background in education. We all learned a lot about communication, and I learned about how the mind conceives and conceptualizes language and culture and transforms it into language. My employer gave me the opportunity to do a graduate program in the evening, and by the end of my stay in Paris I had earned a British certificate in TEFL, Teaching English as a Foreign Language, which had a lot to do with linguistics and educational techniques for language acquisition.

Personally, the most precious insight that I got from my year in Paris was a special kind of confidence. I know now that I can take on a new situation, go into a new environment and learn by doing. I know that I can go into a different cultural environment and grow in appreciation of that culture even if I face a language barrier. I had studied French for the first time only seven weeks before I got on the plane, so I think that it is important to keep in mind, when we are thinking about sending a student overseas, that they often can handle a language barrier.

Fortunately, I was given a lot of independence on my job and was treated as a professor by my colleagues and students. I had never had so much responsibility before, but it created a professional pride in me that I have never gotten in any other job, and it brought out a confident side of me that was not expressed when someone was constantly looking over my shoulder.

One great help to me culturally was an organization which I joined which brought together people of different countries who were either studying or working in Paris. The organization enabled us to take trips together and stay with families for weekends. That is probably how I learned the most about life in France, because I not only saw the city, which is like other cosmopolitan cities in many respects, but I also spent time on a champagne farm, and later with a family in the French alps during a ski trip there. At the end of my year in France I decided to see some other countries, so I started a two-month tour across Europe by train, but I found out that you don't learn as much as a tourist as you do from living somewhere and working there and rubbing elbows with people every day.

Students who go on a foreign work experience uproot themselves from their familiar college surroundings, their university friends, their family encouragement and that whole comfortable environment in order to live in a place where people not only speak differently but think differently. Finding myself in this situation caused me to become aware of myself as an individual in a significant way, all of those familiar supports being gone which previously provided a definition for myself. At the school where I worked I was one teacher out of a large international staff and we learned from each other by sharing our different perspectives. In Paris in general there is a great emphasis on the exchange of ideas about politics, the arts and lifestyles. I learned that my ideas of things as an American form one perspective among many ways of approaching life, and I know now that I can grow tremendously from listening and understanding different ideas.

I will be graduating from Northeastern soon, and I now realize that the most dramatic and broadening educational experience that I have had during my university years did not happen on the Northeastern campus. It happened abroad during my foreign work experience.

SESSION 14: EVALUATING THE LEARNING OUTCOMES

Michael B. Oakes
University of Salford
United Kingdom

1. Introduction

This paper is concerned primarily with procedures for the assessment of industrial training, which vary widely among universities and also among departments within the same university. It is based on a document produced by a panel of six people for the Universities Committee on Integrated Sandwich Courses.

2. The General Problems of Assessment

A number of general problems associated with assessment are:

a. The assessment of industrial performance is primarily subjective.

b. It is difficult or impossible to quantify it.

c. It involves acceptance by the university of the opinions of people who are not members of the academic staff of the university.

d. Performance in industry is influenced by the nature of the industrial environment and by the suitability of the placement. These are outside the control of the student who is being assessed.

e. It is difficult to ensure uniformity of assessment as between one student and another.

3. The Aims of Training

Any methods of assessment should take account of the aims of industrial training. Some of the aims are as follows, not in any particular order and not all applicable in a particular placement:

a. To integrate theory and practice and to reinforce learning.

b. To enable students to relate their specialism to the wider social context and to bring to bear their critical faculties in a non-academic environment.

c. To increase knowledge of subjects outside of the academic course and of the world outside the university.

d. To provide a supplement to, or a substitute for, some university practical work and to enable the student to learn and to appraise practical skills.

e. To gain insight into personal and group relationships in the employment situation.

f. To increase the maturity of the student.

g. To clarify and enhance career prospects.

h. To improve the students' ability to communicate orally and in writing.

i. To provide opportunities for the exercise of judgement and improve powers of decision making. Also to be able to meet deadlines.

j. To be given responsibility.

4. Procedures for Carrying Out Assessment

The assessment of industrial training may be regarded broadly as an extension of the continuous assessment of the student into the industrial period. Two of the main difficulties are:

a. The student has left the university environment, and therefore his progress can only be observed at much less frequent intervals.

b. Supervision of the student is now mainly in the hands of the industrial supervisor who also largely determines the nature of the work to be undertaken by the student.

The areas of assessment include:

a. Extra-mural work. This could be academic work conducted by the student during the industrial period. It could be on a project jointly agreed upon by the firm and the university.

b. A written industrial report by the student.

c. An oral industrial report by the student.

d. A report by the employer or industrial supervisor.

e. Reports by the visiting tutor.

4.1 The Written Industrial Report

There is general agreement that the assessment of an industrial report is a valuable component of the assessment of industrial training. Such reports present a few features which make them more difficult to assess quantitatively than major items of written work in the academic part of the course. Some difficulties are:

a. To what extent does a written industrial report taken on its own reveal the extent to which a number of aims of industrial training have been achieved?

b. There are sometimes problems of commercial security in that some organizations are reluctant to allow reports to leave their premises.

c. The difficulty of deciding the extent to which a report truly represents the efforts of the student. A student may incorporate material which is merely copied from the firm's publications. Also the version which is seen may have been edited or revised under the guidance of a supervisor.

4.2 The Oral Industrial Report

Some universities make a practice of interviewing the student on his return from industry. In such interviews the student gives an oral report on his work to a panel, which includes his academic tutor and an industrial tutor. The aim is to elicit from the student his attitude to the placement and how the experience has affected him.

4.3 Assessment by the Reports of Visiting Tutors and Employers

Normally the employer's assessment is taken at the end of the industrial period and should be examined against a background of interim reports by visiting tutors.

The pro-forma for the visiting tutor should be a guide to the tutor as to the basic enquiries which need to be made and the form should not be handed over to the employer to fill in. The pro-forma for the employer is for him to fill in at the end of the period. It usually contains a number of questions which have to be answered on a five-point scale, together with more open-ended questions.

5. Visiting Tutors' Pro-Forma

The answers to the questions are based on comments by the industrial supervisor together with the visiting tutor's observations.

5.1 The Assessment of the Student's Performance

a. What degree of interest does the student show towards the work?

b. How successful has the student been in adjusting himself to the working situation?

c. What degree of initiative does the student display?

d. What degree of originality does the student display?

e. How well does the student get along with the people around him?

f. (Where applicable) How does the student perform as a member of a group?

g. (Where applicable) Does the student show qualities of leadership?

h. What rating would you give the student's power of communication in speaking? in writing?

i. What rating do you give the student's practical ability?

j. What rating do you give the student's technical knowledge?

k. What is your general impression of the student?

l. What is the student's attendance record?

m. Has the student the sort of qualities you would look for in an employee? If not, where do the deficiencies lie?

5.2 Description of the Working Environment as it may affect the Student's Performance

a. Nature of work in which student is, or has been, engaged.

b. What changes, if any, are envisaged in the nature of this work in which the student is engaged before the end of the period?

c. What are the student's actual duties and responsibilities?

d. What specific skills is the student learning?

e. Does the work form part of an organized training program?

f. Is the work suitable for the stage in the course which the student has reached?

g. How closely is the student supervised?

h. What is the status of the student's immediate supervisor?

i. What degree of interest does the supervisor take in the student's progress?

j. Has the student opportunities to make himself acquainted with the wider aspects of the organization's activities?

6. Employer's Pro-forma

Questionnaire on Student's Performance

The questions below are answered by one of the following ratings: exceptional, above average, average, below average, markedly deficient.

a. What was the student's attendance record?

b. What degree of effort did the student put into the work?

c. How do you rate the student's theoretical knowledge?

d. What degree of initiative did the student display?

e. How was his ability to work without supervision?

f. How successful was the student in getting along with other staff members?

g. How do you rate the student's self-expression in written work? in verbal discussion?

h. What degree of originality did the student display?

i. How successful was the student in adjusting to the working situation?

j. What degree of interest did the student show in the work?

k. (Where applicable) How do you rate the student's practicability?

l. (Where applicable) Does the student show qualities of leadership?

Does the student have the kind of qualities you would look for in an employee? If not, where do the deficiencies lie?

General Comments:

7. The Advantages of Assessment

A structured system of assessment may achieve some or all of the following:

a. Enhance the status of industrial training.

b. Enable visiting academic tutors to counsel the student more effectively.

c. Increase student motivation.

d. Enable the university to assess the value of the training facilities and program.

e. Provide evidence to enable the university to certify to relevant professional bodies that practical experience required by that body as a pre-condition of membership has been obtained.

f. Provide an element (qualitative or quantitative) in deciding the level of degree awarded to a student.

Summary

Assessment of students during industrial training is a necessity. Not only is it a form of continuous assessment but it also makes plain to all concerned that universities take industrial training seriously.

SESSION 15: ESTABLISHING SUCCESSFUL COOPERATIVE/SANDWICH PROGRAMS

Michael S. Wald
Foreign Contacts Advisor, Fachhochschule Hamburg
West Germany

Mandatory industrial experience with institutional supervision is a comparatively recent introduction into German higher education in the technological sphere. The Fachhochschulen system was developed out of the old engineering and professional colleges. They were established in 1970 and were incorporated in the national higher education system. There are some 120 odd Fachhochschulen, some of them being small specialized schools, while the largest in Munich, Cologne, Berlin and Hamburg have up to 10,000 students. Supervised practical training has been in existence within the university system for some time in the form of a "practical year" for medical and agriculture students. Since the Summer of 1978 the Fachhochschule Hamburg has implemented a practical training semester in mechanical engineering and industrial chemistry, transportation engineering, electrical engineering, home economics, and other departments are rapidly following suit. Industrial training has also been introduced in the states of Bavaria and Baden-Wurtenberg. Other states are to follow this pattern in due course.

German education is almost entirely state controlled. This includes higher education. All educational features are legislated down to the minutest details. For example, the number and list of examination subjects are fixed by law. There is an overall higher education bill to which all states subscribe. Reforms or changes have to be submitted to the state departments of higher education, which examine the changes with respect to existing laws or the higher education bill.

This rather tight scheme is in contrast to the concept of academic freedom which is also legally anchored. Consequently, there is practically no state interference with individual academic performance or with examination standards. However, the universal legal basis for all academic matters does perpetuate rather equal academic standards within the country, and there exists no real hierarchy in the quality of education offered by the various institutions.

The consequence of this universality of educational concepts entails that a practical training period for all students at Fachhochschulen is gradually to be introduced by all member institutions.

The training semester is a period of practical training for the aspiring engineer or student in any discipline taught at the Fachhochschule. The period set for this training varies somewhat between different schools. In Hamburg it comprises a minimum of 20 weeks, i.e. the equivalent of one academic term, and is set after four semesters (two years) of theoretical college training. Placements are not made directly by the college. The college can only list possible training places and the student has to file an application with the company. He then undergoes regular company interview procedures. The reason for the non-involvement of the college in direct placements is twofold. The college is state run and is not supposed to experience a real life situation where he has to sell his merits. The situation is not always quite as described, and individual professors tend to recommend certain students for specific jobs, in particular when the job is known to require some research and development where the student's preferences and abilities should be taken into account.

After the acceptance of a student by a company a contract is signed which is based on a standard draft supplied by the college. The remuneration is subject to agreement between the company and the student. It varies considerably and ranges between none at all and $1500 a month. While in training the student is visited three times by an assigned academic supervisor. A number of preparatory and post-training meetings are also arranged.

The introductory phase of industrial and professional training has shown that the number of companies interested in the scheme is growing rapidly. The demand for trainees appears to be somewhat out of phase with economic developments, i.e. placements in a recessional phase become difficult only after a time lag. An interesting aspect is the international phase-shift experience, which I will discuss later. Students often seem to experience a reality shock during their practical training. Some feel that their future job prospects are not quite as sophisticated as their learning experience seems to indicate. Fachhochschule students sometimes feel that their training does not always build upon their previous experience, which was often at the laboratory or technical assistant level, so that the job training level is too low. On the other hand many students are expected to work on new technologies, particularly in the microprocessor and software applications areas. These areas are just not sufficiently staffed by the older engineering generation, so that any additional experience a company can gain via student trainees is being utilized. This in turn is fed back into the college so that, for example, the number of applications for project work in control engineering by students of industrial chemistry practically outstrips the capacity available for such work. The remuneration problem is still under discussion and may in the future be settled through the trade unions with the support of the students and of the academic staff. There is considerable aggravation amongst the students because of the sizable variations in remuneration scales. It is generally felt that a minimum wage should be established by legislation.

Since 1978 the Fachhochschule Hamburg has established fruitful contacts, particularly with British Polytechnics, for supervising and placing students in industry. These contacts have resulted in the placement of students through the institutions in Britain and Germany. The enthusiasm of students working in a foreign country is enhanced by their motivation to present a positive image of their country and their institution. The success of these exchanges is manifested by the number of permanent job offers received by Hamburg students in Britain and in the United States. The advantages of cooperating with educational institutions in a host country lie in the supervision by the academic staff, which results in a measure of control of the students' progress. Moreover, the possibilities of academic contacts outside the training assignment are also considerable. Another advantage of this kind of cooperation is the possibility of mutual assistance during recessional periods which may be phase-shifted between countries. Currently we are experiencing a boom in openings for students in Germany, whereas in Britain placements are becoming increasingly difficult. In this situation we are able to place British students who otherwise may have to drop their industrial training requirements in a sandwich course. A reversal of this situation is also quite feasible. This international cooperation is also invaluable for multinational companies. Our experience shows that these companies reap considerable benefits by the temporary affiliation of a student who could, after completing his studies, work for the company.

Mandatory industrial and professional training is an invaluable contribution to both the student's education and to his educational institution. In particular, aspects of international cooperation in this area, which are rapidly expanding to a considerable proportion of the training assignments, can best be undertaken through agreements between educational institutions. This fosters international understanding and educational exchange on a new, hitherto unknown level.

J. S. Dahele
Coordinator, Work-Study Program
The Chinese University
Hong Kong

In the last 20 years the growth of the electronics industry in Hong Kong has been phenomenal. In 1959 there were no establishments specifically engaged in manufacturing electronic products; today there are over 700 such factories. Furthermore, the industry has recently been engaged in a major diversification program, as well as moving into high technology and up-market products. As a result of these changes the industry has experienced a chronic shortage of technical manpower, but most employers considered graduate engineers too academically oriented and over-qualified for their needs. Consequently, there were very few openings for graduates outside the utility companies and some multi-nationals until recently.

It was against this background that the Chinese University of Hong Kong introduced the four-year, full-time honors degree program in electronics in 1970. In 1972 the Advisory Committee on Electronics was established to advise the Vice-Chancellor on the relevance of the program in fulfilling the needs of the community and the electronics industry in Hong Kong. It conducted periodic reviews of the current and planned programs of the electronics department and made recommendations to the university. Shortly afterward, in 1975, the five-year work-study program was established. This program was intended to involve industry in training manpower suitable for its immediate and future needs. A major constraint in planning this work-study program, however, was that it was designed to require little or no rearrangement of courses since no additional staff, over and above that required to run the full-time program, would be available.

In September of each year the students who wish to join the work-study program apply to the department and go through a preliminary selection. Students with poor grades are advised not to join, since failure in either of the first two parts of the degree examination will increase the duration of the program by one year. Towards the end of September the employers participating in the program are invited to submit a company prospectus and an outline of the training program. Based on this information the students select up to three prospective employers each and submit applications requesting sponsorship. The final selection is based on interviews with the employers, held at the university towards the end of October. There are two work periods, and the students stay with the same employer for both of them. The advantages of a program such as this accrue mainly from the fact that, having undergone substantial training, the graduates can be usefully employed in industry as soon as they leave the university.

At the time of joining the program each student is assigned a supervisor in industry and one in the university. The university supervisors are available for advice in case the employer has difficulty in preparing a suitable training program. The industrial supervisor, who is a qualified engineer, monitors the student's progress and ensures that the training schedule is adhered to. The students submit two formal reports in each work period and the university supervisors visit the company concerned to discuss these reports and to ensure that the training program is properly carried out.

A realistic training scheme must take account of the conditions prevailing in industry in Hong Kong and be sufficiently general to meet the requirements of professional engineering institutions here and abroad.

This type of training is possible, however, only in a research/development environment covering a wide spectrum of engineering activities. Given the present situation in Hong Kong, where most employers specialize in specific product lines and only a few have facilities for general in-house training, it is difficult to persuade all employers to provide a uniform wide-based general training. These problems are in no way peculiar to Hong Kong, and they place severe constraints on planning a suitable training schedule. In fact, most countries which are in similar stages of development in this region experience similar problems.

In view of these problems, a working-party of the Advisory Committee on Electronics was set up in 1978 to review the work-study program. In conducting the review, the working-party consulted both the students who had just completed training and the training officers responsible for providing this training. The working-party recommended tightening up training and supervision and laying down guidelines for employment after graduation. So while its quality and scope still need further improvement, it is worth noting that the training provided under the program has so far been accepted in partial fulfillment of the training requirements of the Institution of Electrical Engineers (U.K.).

In the five years since its introduction, the number of students applying to the program each year has exceeded the vacancies available. The students appreciate the importance of industrial training and the fact that very few employers are willing to offer this type of training outside the work-study program. Acceptance of this training by the Institution of Electrical Engineers is a further incentive. A second and in some cases even more important reason is financial; the salary paid to the students during training enables them to go through the university with considerably less of a financial burden. So far, in almost all cases the students have returned to work for their sponsors upon graduation, their starting salary being higher than that of the students graduating from the regular full-time program.

This work-study program has some novel features which might make it particularly suitable for developing countries. The involvement of the Advisory Committee has been crucial in promoting the program in industry and securing its widespread acceptance. The relations between industry and the university are very close, and in this atmosphere of cooperation there is a better understanding of each other's needs. Through this program, industry is able to build a pool of trained manpower essential for its present and future needs.

SESSION 16: INTEGRATING THE WORK EXPERIENCE AND THE CLASSROOM

Thomas H.J. Stoelinga
Netherlands Council for Higher Vocational/Professional Education
Holland

The relationship between education and work has always been very strong in professional or vocational education in the Netherlands. Already at the end of the nineteenth century schools for professional education existed. Since that time a network of such institutions have gradually spread all over the country. This development was most significent in the sector of secondary education, although the first institution for higher professional education was founded more than a century ago. From the very beginning this type of education has not been restricted to trade and industry, but has been practiced on a large scale for many occupations. Since World War II there has been a rapid increase of institutes for higher professional education, and nowadays there are more than 300 institutes in all fields of higher professions. These fields are divided into ten main categories: technical and laboratory education, navigation, health and medicare, teacher training for primary and secondary schools, business administration, art education and others.

Apart from these institutes for higher professional education which normally train students for only one profession, there are 13 universities in the Netherlands. Although the institutes and the universities are divided by tradition and history, there is at present a development toward more cooperation and coordination between them. Also the difference between the graduates of both types of higher education is becoming less relevant. On many occasions employers equally appoint people coming from the universities and the institutes of professional education to staff and executive level jobs. As a result of these developments, the Dutch government is preparing a new legal structure integrating the two types of higher education within one system. Admission to the institutes of higher professional education is open to those who have passed secondary school examinations. Varying between the categories, 60 to 90% of the students come from general secondary education schools with a five-year program. The courses in most of the categories of higher professional education are four years, although the programs of the various categories differ with respect to structure and content due to the different requirements of the future professional sector. Generally, much of the curriculum is taken up by the teaching of the basic subjects, the development of practical skills and acquainting the students with their future profession by means of a short training period. In most cases the third year consists of one or two periods of compulsory training in cooperating employer organizations. By gaining practical experience during this education, an integration comes about with the student's academic studies. The students' professional training, personal development and academic knowledge are enhanced by the interaction of the study and work experience.

The programs in the institutes for higher professional education are more or less similar to the thick sandwich courses of the polytechnics and some universities in Great Britain. In some categories the thin sandwich courses also exist. In their senior year the students return to their institutes to prepare themselves for the final examination. In many cases they have to work independently on a special project resulting in a thesis or paper which forms a substantial part of their examination. Frequently the students work together with a cooperating employer organization on this special project.

How does the integration between education and training take place in practice? In the first place all the training periods, with an emphasis on the long training during the junior year, take place under the auspices of the institute of education. The institute is fully responsible for finding suitable training positions and for assuring that the students will be placed. The cooperating employer organizations have to subscribe to the educational objectives of the institute. During their training period, students get special guidance from members of the academic staff, who visit the students regularly and hold meetings with both students and the staff members from the organizations who are responsible for the students. They assist in solving problems and arrange for and assess students' reports. Thus the organization and the institute share responsibility for the student during the training period. It is very important to state that a student is not formally an employee. The training period is an educational experience rather than a way to get a job and earn a salary. This does not rule out that he will have to do regular work with this organization. In many cases students get a small remuneration and of course their expenses are paid. This applies especially to training in trade and industry and agri-business. Students have to report back to the institute of education and at the end of their term they have to write a report which is reviewed and assessed by the academic staff and the councils of the organization.

Secondly, the relationship between the classroom and work progresses gradually. In the first year when the students receive the theoretical basis, information is given about possible occupations after finishing their studies, and short excursions are made to employer organizations. Thus, students can explore the possibilities and prepare themselves for training periods later on.

During the second year they are, in most cases, on training periods ranging from a few weeks to as much as eight weeks. The aim of these training periods is mainly to orient them to the professional field. Afterwards, with the help of the academic staff, the students will have to find a place in an employer organization for the training period of the third year.

In the third year an optimum is reached in the relationship between study in the classroom and working in an organization. The objectives of this training period are a deeper orientation to the future profession, and practical training. Students have to apply their academic knowledge to project problems. In many cases they will be involved in problem-solving projects, in other cases they will get a specific task instructed by a supervisor at the institute in cooperation with the employer organization.

There are, of course, differences in approach and method of these training periods, depending on the profession for which the students have been educated. For instance, a student in the field of social welfare deals with people, and he will not be directly involved in solving complicated individual or group problems. First, he will have to assist an experienced employee before working more independently on cases. On the other hand, students of institutes of technology or business administration are already working in an early stage of their training period rather independently on projects or cases.

Apart from the counseling which I have already mentioned, there is also feedback to the classroom during the training period. Once every few weeks students return to the classroom to inform their fellow students of their own experiences. These are very useful meetings, as the students work with different employer organizations. They brief their fellow students on the projects on which they are working and explain the difficulties and problems they have encountered. In this way they learn from each other. Sometimes gaps in the theoretical knowledge are observed which can be eliminated later on during the courses.

In the final year the integration of the classroom and the work experience is strongly related to the training periods of the previous years. First of all, students have to spend several months working independently on their special projects. In many cases these projects are related to the work they did during the training period. Secondly, the courses deal with case studies or projects related to the experience of the training period. Thirdly, courses are given on theoretical subjects in which need still exists.

The system differs if part-time rather than full-time students are involved, especially in the categories of social work and health care education. Those who apply as part-time students must already have relevant work experience. During the courses they do not have to pass a training period. This type of education is an example of concurrency in that theory and practice influence each other in a permanent and constructive interchange. Thus the duration of study is shorter but leads to the same diploma.

Cooperative education in the Netherlands faces several problems. First, there is an increasing shortage of staff members with adequate practical work experience to teach the students. Secondly, in some categories there is a shortage of placements in employer organizations for students who have to do their training period. This is a result of the worsening economic prospects of these organizations. Thirdly, cuts in expenditure for education lead to less time and money for development of curricula, evaluation, guidance during the training period, and research for a better relationship between theory and practice.

On the whole, however, the advantages still prevail. First, cooperative education stimulates insight into the area for which the students are trained. Secondly, the linkage between theory and practice increases the motivation of the students from the very beginning of their training. Thirdly, cooperative education promotes responsibility and reality as students already during their training learn what to expect from their future professions. Students learn at an early stage to deal with and to cooperate with people of different backgrounds. Cooperative education provides students with the possibility of finding out during their study which job suits them best.

A.J. Prescott
University of Bath
United Kingdom

We at Bath University have been examining the education of engineers in general, and we have been running a four-year sandwich course in electronic engineering for some twenty years now. This course has within it the traditional three-year course of a British university plus some 15 months of experience in industry, which is divided into three periods during the four years. In fact, we were approached by one of the major companies in England, G.C. Marconi Group, because they were dissatisfied with products of British universities, including those people who had followed the sandwich course. They recognized that the sandwich principle gave students a head start over the traditional three-year students, and that these students became professional productive engineers much more quickly than the traditional student; but it was still years before they could assume a position of considerable responsibility. G.C. Marconi Group wanted to cut this time period down. We carried out a feasibility study for them. We looked into their requirements for graduate engineers, and the result has been a new four-and-a-half year course which has produced some rather interesting things as far as our traditional sandwich courses are concerned. So I will talk about the results of these studies rather than about our traditional three-year course. Incidentally, when we started this study, the G.C. Marconi Group themselves had a requirement for graduate electronic engineers which was in excess of the total output of British universities in that one year, and in fact they went to Australia to recruit the additional ones. We are seriously short of engineers in Ireland, but it is beginning to level out a bit now.

We found out that the training in industry was very inefficient, and that the only way that a student could learn would be when things went wrong and he became a nuisance. As a result we have looked at a series of things that have gone wrong in industry in general, and we have brought this back into the classroom situation. For example, one of the big disasters recently at Three Mile Island has been so well documented that I think every engineer should examine it because he can learn much about what has gone wrong in the design of something so big. This happens all down the scale to the smallest radio set; something always goes wrong. We try to bring this out, and we have developed within the university what we call support technology, that part of the student's education which is required to support the technical element of his electronic engineering course. Within this we have developed a thing called product enterprise where the students work in small groups and develop a product for industry over a two-year period, spending five or six hours a week on this from initial conception through market survey right through to final drawings for production. They do this not from our ideas but from industry's ideas.

We have looked at the role of the design engineer in particular, and our whole course is aimed at producing a very efficient design engineer. We felt, as a result of our feasibility study, that there were three particular areas that this student in this field needed to know intimately: the production process, the commercial process and the design process. We have so tailored the course that the student follows those patterns of production, commerce and design in three separate periods in industry.

Before we started on the course we found that there was also a need for students to learn a little about industry even before they came to the university. There was a gap in their education; they finished school but they knew nothing about industry. So we developed a three-week pre-university course in which we took them through the systems of industry, showing them how the systems function as one. During the first year students followed courses on production, design for production and quality in engineering before going into industry for their first period.

Now let me talk about that one period and tell you what we have done with the cooperation of industry. We have now extended this from G.C. Marconi to about half a dozen other major concerns covering some thirty divisions, operating from radar engineering on one side to fire station projects on the other end of the electrical engineering spectrum. Within that compass of products, every student who goes into industry for that period of the production will have a project. The object of the project is the same for every student and involves producing a production schedule for a particular piece of apparatus. We have gone to the extent of setting up a policy committee for this course composed of people from industry and from the university to examine every single item and product that the student will have to look at. All these divisions all over the country send us their drawings and, in some cases if it is small enough, the object, to be examined by this committee. So we are collaborating very closely with industry.

In the first round of the first year we found that there was a lot of mismatch between one company and another. We had to spend a lot of time going back to companies and saying, "This particular piece of apparatus which you have chosen as a product is not good enough because it has too many circuitboards, it has very little mechanical engineering attached to it, it is all manufactured inside, it does not cover the complete spectrum of the production process." We are just now starting on the next stage of the industrial period, which is the commercial side.

This will involve only a little bit of market research; it will be mainly concerned with contracts. We found that the design engineer, when designing in industry, was totally unaware of the limitations of the contract. So when the students come back we have a general wash-up session with them in which they can learn from each other, because some will have been at the forefront of technology while others will have been dealing with a product which may be ten years old and have technology which is a little dated.

We take in about 100 students a year in electrical and electronic engineering, and have ended up cutting down the period that the student spends in industry. We have, however, made that period in industry much, much more efficient. We know exactly where the student is week by week, and we know the people to whom he is reporting. What's more, the student also knows before he goes into an industry exactly what he will be doing. This is extremely time-consuming for people in our department.

Our findings with industry have produced what appears to be something different from what is the normal sandwich course. In face, we have taken the training in many cases out of industry and put it into the classroom, because that is where we can do it efficiently. In industry it happens quite often by chance.

Robert Houston
Ulster Polytechnic
Ireland

I want to stress that ours is a British program in a British context, but which can be translated into other cultures in other countries. We call it "A Teaching Company," and it is very roughly analogous to a teaching hospital, where people who want to study under a particular medical expert will go to a certain medical school and receive instruction from this expert. Here the analogy breaks down; as I said it is a very loose one.

I think you should first of all understand the context and why a scheme like this is needed, or seems to be needed. The very best students in Britain do not go anywhere near engineering. Of the best who do, most of them end up either in the civil service or in teaching establishments. That is only a crude generalization and it is wrong in some instances; trends occasionally vary. But the best engineers are still in the civil service and in the colleges and universities. Our scheme, therefore, has four objectives: to improve the viability and profitability of the manufacturing industry; to attract well-educated and highly-motivated young graduates into the manufacturing industry; to tackle real and important problems within those industries; and in fact to strengthen the links between industry and academia. But how does the teaching company work?

Essentially the first thing you must know is that it uses government money. For many years government has supplied money to an organization known as the Science Research Council. This council has four divisions, two of which are engineering and science. By and large these are dominated by high-flown academics with very narrow disciplines, as a result of which we probably spend more per capita on astrophysics than the United States does. There was a general feeling that not enough was being done about real problems much closer to the ground. They decided, in conjunction with the Department of Industry, that they would fund this Teaching Company directorate. The current funding is the equivalent of about $5 million a year, and they did a little bit of publicity on it. An education establishment simply has to capture a firm, tell it what a brilliant thing this is, and jointly write a proposal and submit it. If it is approved, the central control that follows is very benign indeed. You have to meet in a management committee about once every three months, but basically the whole thing works with the company and the academic institution.

One of the first tasks the company has to do is get its hands on good young graduates, hopefully with a very good honors degree and probably in engineering. We have not been brave enough to ask ourselves the question of whether these are the important qualities. We have certainly noticed that the personal qualities of the individual seem to be much more important than academic excellence.

The scheme is rather formal in some sense. A whole program is laid out. Rule number one is that you must go right to the very top. You are not working in an office down the corner on some interesting problem; you are working on a problem which the managing director of that firm has defined as something that is burning his fingertips and that he wants help on. You jointly appoint your associates. In our programs we first of all assign two staff members as co-workers. They are picked initially because they seem to have the sort of expertise that is directly related to the problem that the graduate will attack. After a little while he becomes his own expert and they become father figures. Then they assume a different role because they know the institution better than he does, and tell him where to find different types of information as soon as his problem starts running wild, which it frequently does.

I would go back and stress that these are very real problems; they are not classroom exercises at all. The funding actually provides for reducing the teaching hours of the two members of the academic staff so that they can be made available. Moreover, they are extremely keen to participate in this kind of program. They help a great deal and work as a team. Some of the results that have been produced are quite startling.

There are about 50 of these teaching companies operating in Britain right now. The University of Bath has one. We have three, and they are totally different. So we are unique in that sense, and hold the record at the moment. One teaching company deals with about twenty small firms. If you fear the uncertain, the unknown, taking risks, then this program is not for you, at least not for many small companies. The problem with a larger company like General Motors, of course, is that you will never get to speak to the general manager. You will not really be calling the shots on that program.

We have been running this scheme for about three years. We promise a two-year contract, and promise the student that after that two-year contract he will be out of work. It is up to him to make his mark in that company by demonstrating that he really is top management material. We are trying to get this fellow of about 25 years of age to operate at the end of two years in a position that a 33 year old would normally occupy. And if this seems too wild, I do not believe so. I recently reviewed a book which analyzed where managers had come from and what their experience had been. There was a general consensus that the best managers seem to be those who early in their careers had lots of experience and responsibility placed on them, and had a great deal of trust from the company. The teaching company epitomizes this. We have three people who have already moved through this program. All are under 30, and all are managing directors of their own small companies. They did not elect to go to the companies in which they were working; they started their own. In my own view this is success.

SESSION 17:
DEVELOPING COOPERATIVE/SANDWICH PROGRAMS AT THE GRADUATE LEVEL

David Blake
Dean of the College of Business Administration
Northeastern University
United States

I would like to begin by telling you a bit about the graduate level cooperative education program that we have at the College of Business Administration at Northeastern. We call it our Management Intern Program, and we have some rather substantial experience with it. We admit about 100 students each year into this program, which means that at any one period in time we have approximately 175 students active in this MBA-level cooperative program. Students are admitted in January and in June to what is a 21-month program. The first six months are spent in full-time class activity, which is followed by a six-month work experience, and the whole program is completed by nine more months in the classroom. These students complete in five quarters what full-time MBA students normally complete in six. As a result the course work is necessarily accelerated, in that they are generally taking six courses as opposed to four or five that are likely to be the case for the regular MBA level students on a per quarter basis.

While in the field or at the work experience, students are not enrolled in any formal classes, because we do not think that a cooperative education student should be expected to go to school and work at the same time. Another reason for this is that we are able to place our students all over the United States, and consequently they are not all locally in residence. For the six-month work period students are placed in jobs related to various areas of business, government and manufacturing and service industries. About 50% of these placements are with firms and agencies outside of the Boston area, and they include such typical assignments as financial analysis, cost accounting, market research, bank examiners, product management, purchasing, etc. Salaries for our management interns range from $835 per month to $1600 per month, with a median of around $1300. Obviously this money is useful in financing their education.

The structure of our intern program is not necessarily a blueprint for other graduate cooperative education programs; indeed, we have been through three or four major changes over the last twelve years. The goals of graduate cooperative education programs large or small are basically similar to those at the undergraduate level. The graduate program does provide professional experience, financial assistance, interface of career and classroom environments and the integration of work and learning. Beyond these basic objectives, though, there are several characteristics and problems perhaps unique to the graduate level.

First there is the nature of the graduate student. Graduate students are likely to be more mature, far more career oriented than undergraduate students, and not so willing to engage in experimentation for experimentation's sake. They tend to be far more demanding of faculty, administrative staff, and their work experience, and to have distinct wants and needs in terms of what it is that they wish to gain from their work experience. They have generally a higher expectation in relation to the kind of position and experience they have during their intern period. They often have expectations, perhaps a little bit inflated, of prestigious title and salary regardless of their particular experience. But the key thing to remember is that this is a highly selective, highly motivated set of students who have entered an accelerated program and are seeking the same kind of accelerated challenge in the cooperative experience as well as in the classroom.

Some employers just do not see the advantage in hiring a graduate cooperative education student for a position that they feel could be readily filled by an undergraduate student at perhaps less cost. Furthermore, many companies would rather send their own employees through some kind of graduate program, thus guaranteeing company loyalty and benefit from the educational experience. But in spite of some of these difficulties, we have found in the case of our management interns that a major advantage to the employer is the great maturity of the student, who is often exposed to delicate situations which a less mature, somewhat less experienced undergraduate would have difficulty dealing with. Moreover, given our accelerated time frame, we find that employers turn to our intern program as a means of recruiting and screening potential employees, and this is very important in a very competitive market. The intern program is perceived as a way of attracting students to that company to begin with, and then secondly of having a chance to look at them on the job to find out whether the fit is a good one or not. And many of you know that the costs associated with hiring a person who does not fit in well are rather substantial. For this reason our program is rather attractive.

To help insure good placements in the intern part of our Master's level program, we at Northeastern use a very careful screening process in admitting students to the intern program. This helps to reduce the chance of misunderstandings or conflicts between employers and students as to what their jobs are going to be like. As part of this screening process the student is given a realistic view of positions available, possible salaries, job locations, etc., and our students have to be willing to relocate in order to take advantage of these experiences.

The shortened time frame that exists at the graduate level does, however, cause some substantial administrative problems. We have a required set of courses which are demanded by our accrediting agency, so we do not provide a great deal of time for the student to experiment in terms of courses, but that is endemic to an MBA education in the United States. Equally as important, we do not give our administrators enough time to conduct orientations, to interview, to line up cooperative employers or to evaluate student strengths and weaknesses.

We have found in the intern program that mandatory participation in the cooperative experience is a very positive thing. This allows our students who are involved in this program to have instructors who realize the nature of the experience the students have, and they can play to this, they can use it in the courses that we have, and they can build upon it. This would not be possible, perhaps, in a mixed class of intern students and regular students.

The potential for graduate cooperative education programs in this country has barely been tapped. It is widely recognized and accepted at the undergraduate level, but much less so at the graduate level. One of the results of this is that we in the graduate education business frankly are not meeting the needs and demands of our potential students. I have been impressed by the number of students, particularly in the business field, who when they look to MBA programs are seeking to find out if there is an internship available. Building it into the core of the program, as we do in this case, is very beneficial, but we generally have not done a very good job of this. Perhaps graduate level cooperative education offerings may increase as we develop more programs for an older adult student population that either takes advantage of the work experience or helps finance some of the education.

We at Northeastern have attempted to develop a number of different things that will bring about a greater degree of integration of the internship and the classroom experience. One such thing is the residency. When our students first arrive on campus, they have a residency period together of about four or five days. After the students come back from their six months on the job, they again have a residency experience involving faculty members. This gets them back into the swing of things and takes advantage of some of their experiences.

Finally, let me share with you a point which I personally think is rather critical, and it is a fundamental concern that I have about graduate level cooperative programs. Frankly I think that all around the country, and I suspect in other countries too, we have done far too little to build upon the work experience and use it in the classroom, and the reverse. Too often the two experiences are unrelated, even though they are sequenced in one fashion or another. But they are not interwoven; the one does not contribute to the other except perhaps largely on the initiative and the integrative powers of the particular student. Thus our classwork may not take advantage of the intern experience, and the work experience does not necessarily consciously build upon the classroom experience. That bothers me because they are both very excellent learning experiences, and we need to get some synergy in this area. Our faculty at Northeastern is committed to the intern program, and that helps. We have instituted the residency programs, and that too helps. But somehow I feel that we have not gone the next step to really examine the nature of the curriculum, and to change and adjust and revise the curriculum where necessary to take advantage of the experiences that our students are bound to have had in the job situation.

I feel too that we have not done enough to stress the intellectual and academic experiences associated with the cooperative education program. We hear how good it is to be exposed to the real world, how excellent it is to get the extra financing, and so on. What we must do, I think, is to develop a rigorous academic orientation to such cooperative education programs, so that our business, which is education, includes this. These are several of the problems with which we are faced.

Lloyd A. Bates
Portsmouth Polytechnic
United Kingdom

and

John E. Flood
University of Aston
United Kingdom

In the United Kingdom, cooperative education is well established at the first degree level. 10 universities and 30 polytechnics currently provide integrated sandwich courses leading to bachelor's degrees. Over 50,000 students are enrolled in such courses.

In contrast, the number of post-graduate students enrolled in cooperative programs is small. In Britain, higher degrees are seen as improving career prospects in academic institutions, but not in industry and commerce. Consequently, few graduates in industry seek post-graduate education and still fewer are encouraged to do so by their employers. The exact number is unknown. Studentships to support post-graduates in science and engineering are awarded by the Science Research Council (SRC). In 1980, about 3,500 studentships were awarded, but it is estimated that less than 1,000 of these were provided for students to participate in cooperative higher degree schemes. This represents a very small proportion of the graduates entering industry. However, industrial interest is increasing. For example, the Finniston Report on the future of the engineering profession recommended that a substantial number of future engineers should be trained via the cooperative Master of Engineering courses.

Master's courses are a relatively recent event in the U.K., having developed during the past 25 years. In the field of management these courses have been fairly successful. An MBA course is seen by some as a bridge between an initial career as a specialist and a subsequent career in general management. In science and engineering, Master's courses have been less successful. Courses designed to provide specialist knowledge of modern technology for British industry are kept going by the presence of students from other countries.

The efforts of academics have been supported by SRC. Someone who has worked for at least a year in industry can apply to SRC for an "instant award." The Council makes its decision quickly, so that he can make the necessary arrangements with his employer. 97 awards were made in 1980. If the employer decides to sponsor the student for the course, an "industrial studentship" is awarded. This enables the employer to supplement the studentship awarded by SRC, so that the student can receive a full industrial salary while studying.

A common feature of Master's courses is a substantial project. In some courses, this occupies six months of the total 12 months of study. Often the regulations of the course permit the project to be undertaken in industry under the joint direction of an academic and an industrial supervisor. This provides a cooperative course. The formal study is carried out in the university or polytechnic and the project is carried out in industry. The employing company gains the benefit of the student's increased knowledge, the project is chosen to be of direct benefit to the company, advice is given by the academic and SRC provides financial support by means of the studentship awarded to the student and payment of the college fees.

In 1966, recommendations on the training of graduates entering the engineering industries were made by a committee under the chairmanship of Dr. G. S. Bosworth. One of these recommendations was that the training should include a course on the technology of an industry's product, to be organized jointly by the industry and an educational institution. A number of such courses were started; inevitably they became known as "Bosworth courses." An example is the six-month post-graduate diploma course in telecommunications technology at the University of Aston. All students on the course have had experience in the telecommunications industry and are sponsored by their employers. Although the course is complete in itself, holders of the diploma may qualify for the M.Sc. degree by carrying out a suitable project in industry and the majority of them do this.

For many years, traditional universities have permitted their graduates to register as external candidates for research degrees (Ph.D. and M. Phil.). These arrangements are not cooperative schemes. The university acts only as an examining body and is not involved in the research undertaken by the student outside the university. These arrangements have been developed into cooperative schemes by the new technological universities, which have the experience of undergraduate sandwich courses, and by the polytechnics, whose students study for higher degrees awarded by the Council for National Academic Awards. The research undertaken in industry is supervised jointly by an academic supervisor and an industrial supervisor, and the student is required to participate in courses held in the university or college.

These attempts to introduce cooperative research have been encouraged by SRC. Instant awards and industrial studentships are awarded for research study in addition to graduate courses. The Council has also supported a number of special schemes by reserving awards for students on these schemes.

One SRC scheme is the CASE scheme (Cooperative Awards in Science and Engineering). Under this scheme, a university or polytechnic department agrees to undertake a research project which will be useful to a company in collaboration with that company. SRC awards a studentship for a post-graduate student to carry out the research under the direction of an academic supervisor and an industrial supervisor. The company may also make extra payments to the student as an incentive. CASE projects have been carried out in a wide range of subject areas from mathematics and computing, through biology, chemistry and physics to every field of engineering. In 1980, about 750 CASE studentships were awarded. CASE awards are normally for a three-year period for Ph.D. research. A similar scheme, known as CTA (Collaborative Training Awards) supports students for cooperative programs of 12 to 15 months' duration. Since these programs cannot lead to Ph.D. degrees, they are less popular than CASE awards, and only 13 CTA studentships were awarded in 1980.

The SRC's Total Technology scheme is similar to the CASE scheme, except that it is tailored to the needs of engineering. In addition to carrying out research on industrial problems (as in the CASE scheme), students attend formal courses in subjects such as design, economics, marketing and finance. Total Technology programs are currently provided in eight universities and two polytechnics. In manufacturing engineering, SRC has encouraged Teaching Company schemes. Each scheme is a partnership between an educational institution and a company in which post-graduate students undertake to achieve a substantial change in manufacturing methods. Teaching Company schemes are currently operating in 16 universities and eight polytechnics.

During recent years, interdisciplinary studies have been developing in universities and polytechnics at both undergraduate and post-graduate levels. This development has been recognized by the SRC and the Social Science Research Council (SSRC) jointly awarding studentships for Master's courses and Ph.D. programs that are neither purely technical nor purely social. In 1980, a total of 40 of these joint scholarships were awarded. An example of such a scheme is the Interdisciplinary Higher Degrees scheme at Aston. Each Ph.D. student has two supervisors, from different university departments, and a supervisor from the organization sponsoring the student's project. This organization is usually an industrial company, but is sometimes a public service.

In Britain cooperative schemes of education at the post-graduate level have been invented by enthusiastic academics; they have been well supported by government research councils and by a small number of enlightened industrialists. At present, these efforts are ignored by most of industry and commerce. However, progress is being made and the climate of opinion in industry is changing. It is expected that the benefits obtained from cooperative post-graduate schemes will become more widely recognized in the future and participation in them will increase.

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SESSION 18: STRENGTHENING EMPLOYER RELATIONSHIPS: AN INTERNATIONAL PERSPECTIVE

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United States

Mobil Oil as a corporation has been fairly active in the field of hiring students through the cooperative education approach, and has been very successful with it. We would like to think that whenever we hire an individual, whether it be for cooperative activity or for full-time employment, that the individual selected will remain with us permanently. We have found that the cooperative approach to education increases the probability of this happening. It gives the student an opportunity to experience the company and it gives the company an opportunity to experience the student, and it ensures us that the right decision will be made when the time comes for making final determinations for employment.

The comments I will make about improving or developing employer relationships apply to cooperative students as well as to full-time students, the end goal for both being that they will find themselves in career pursuits which are best fitted to their abilities and their interests.

The foremost attitude that I would suggest today for the development of these relationships is what I call an open door policy. Universities must make employers feel welcome regardless of their business endeavors or the students' fields of study. Universities do not have to court industry; they only have to be open and interested, that is, interested for the students in insuring that the right people are nominated for the right kinds of positions.

How do you approach and generate this open attitude? Your college placement office is the foremost area where this open attitude can be generated and projected as hundreds of companies are visiting these offices throughout the course of the year. Also, career days on campus are outstanding opportunities for employers, faculty and students to meet each other.

How do you maintain relationships with employers once you have established them? I would say that consistency of policy would probably be the best way to do this. In the educational field employers often develop outstanding relationships with contact officials. Lines of communication are established and we know each other's objectives. But often there are developmental changes within universities which result in personnel changes, and the same thing happens with us. I would encourage you to see that you maintain a consistency of policy throughout those changes; otherwise it weakens relationships which a lot of people have worked on prior to that point.

Another good way to strengthen relationships is through faculty visits to the offices of employers. I know that our company for one is quite eager to have all of you come to our offices and meet us. We put on presentations and express our objectives, which improves understanding and provides an ability to communicate for the time when your students come to you for opinions and recommendations about particular companies. When you receive these invitations to come to the offices, I would certainly encourage you to accept them; but do not hesitate to solicit invitations yourself. Companies usually do a fine job as far as presenting to you what their employment objectives are.

How do you strengthen and expand upon good employer relationships? This can be summed up in one word: communication--communication between the employer and the placement contact and communication between the placement official and the balance of the faculty. We all must discuss what we are doing together to prevent putting people in positions for which they are not suited.

Finally, what do employers expect from students today? Because of the competitive nature of today's market, they do expect a lot. They expect students to have a sense of direction. This is not to say that they must have a specific job title in mind which they seek as soon as they start work, but if an individual is an accounting major, for example, he or she should have decided which field to pursue and not still be wondering whether to become an engineer. I agree that it is probably the most difficult decision that a student makes, but it *is* something that employers are looking for, so I encourage you to communicate this to your students.

Another expectation in this category is that when students are interested in a company, they should do their homework on that company. They should find out what the company does, how it does it, and perhaps how the students themselves might be able to make a contribution. The companies do a fine job of providing the universities with many publications on what they do, and they are usually located at your placement office. Students should interview with a company because they have a personal interest in it, not just because the company is big.

Another thing that we are looking for is good grades. Good grades tell us how fine an education students received while they were at the universities, and they also demonstrate to us that students have the ability to make use of that education in learning our business systems. So grades are important, although we do not look strictly at the numbers. In today's market there are certain intangibles that we are also looking for, such as leadership qualities and the ability to be a self-starter.

The last and most important intangible quality we are looking for in a student today is commitment to being successful. More specifically, commitment means that you are willing to accept sacrifices in order to be successful. If students do not have this sense of commitment, if they will not accept the necessary sacrifices, it will be a negative factor for them.

This sums up my general comments about what we might do to enhance employer relationships. All of us are working together towards the same goal, and we need you very much in order for us to accomplish our objectives, because ours is a business of people and you are preparing them.

SESSION 19: LABOR-MARKET PERFORMANCE FOR COLLEGE STUDENTS AND GRADUATES IN SELECTED DEVELOPING COUNTRIES

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In many developing countries, particularly in the Orient, education was thought of as a cultural good for the individual development of the mind and considered to have nothing, or very little, to do with the economic well-being of the individual. This was true in many cases until western education spread to those countries with its materialistic and skill-formation bias. When western education came to these countries, however, the traditional cultural aspect could not be entirely set aside. In many countries the feeling of relating education to work was a mixed one, and in some countries as late as the mid-'70s education expanded even at higher levels without giving consideration to the employability of the school-leavers. On the other hand, the key production and service sectors of the economy, even in developed countries, did not want to have much to do with the formal system of education.

With the spread of western education among the developing countries, and more so during the decolonization period of the '50s and '60s, the need for education to be integrated with working life was more and more appreciated. However, progress in this respect has been minimal. The formal educational system has expanded rapidly during the last three decades with a structure and content in many developing countries that leaves much to be desired in quality and in form. Co-ordination between the institutions of education and employment has also been minimal, as reflected in some of the country studies undertaken by the International Institute for Educational Planning (IIEP) in the following areas: (1) career information, (2) placement services, (3) recruitment criteria, (4) usefulness of training for the working life, (5) job satisfaction, (6) need for alternative structures, and (7) employer's attitude to education.

With respect to career information, it was noted that although a large percentage of students pursue education for professional reasons (e.g., 64% in the Sudan, 85% in Zambia, 95% in Tanzania and 81% in the Philippines), 71% of students in the Sudan, 41% in Zambia, 78% in Tanzania, and 60% in the Philippines felt that such information was inadequate.

As regards placement services, the institutional mechanism is severely inadequate in many developing countries. Guidance counselors and the university employment offices cater to only 16% of the placements in the Sudan, whereas friends and relatives take care of one out of four placements. In the Philippines, personal contacts play the most important role in placement of graduates. In Egypt, however, the Ministry of Labour finds placement for one-quarter of the graduates according to the IIEP surveys.

With respect to recruitment, academic performance is the most frequently used criterion, although the employers in all the countries studied believe that there is no correspondence between academic and job performance. They would have liked to have the past experience on a similar job be the most important criterion, but few of the candidates had such experience.

Concerning usefulness of the education/training received in formal institutions, two separate characteristics were used: first, the need for the training to obtain the job, and second, the usefulness of the training in performing the tasks. For the first, in general the majority of graduates (varying from 85-95%

depending on the country) thought that the training was necessary to obtain the job. This may be due to the fact that employers do give importance to credentials when recruiting employees. This also supports the role of education as a screening device, but as has been mentioned before, the employers do not find a significant correspondence between academic and job performance. However, the graduates' opinion differs from that of the employers in this respect, because in most cases they feel that their training is useful for performing the tasks. The proportion of graduates assessing their training as useless for the job varies from 2% in Zambia to 14% in Egypt.

With respect to characteristics of the job and making it attractive to an employee, there is very little correspondence between the perceptions of graduates and of employers. Analysis was done with 14 characteristics of a job.

As for alternative structures of education in order to make it more responsive to the world of work, work experience integrated with the educational process has been suggested to be the most effective structure. In one case, the need for teachers' orientation towards practical work has been noted to be the most effective method. This justifies the need for cooperative education, as will be elaborated upon below.

The employers appear to be enthusiastic in cooperating with educational institutions. The public sector undertakings appear to offer more cooperation in the areas of in-service training, sandwich courses, etc. In return, they would expect the institutions of higher education to be concerned with their needs.

The above would only suggest that integration of work experience with the formal education system would go a long way to reduce the problems facing the graduates. The concept of cooperative education used by the Conference attempts this kind of integration. Cooperative higher education is an academic strategy that integrates on-campus classroom study with off-campus work experience. Students in cooperative education programs alternate between periods of study in their colleges and universities and periods of employment in business, government and non-profit organizations. Employment areas are directly related to academic areas. Depending on situations, such work experience is given due academic credits and may be remunerated (e.g., U.S.A., United Kingdom) or honorary (Federal Republic of Germany). This concept relates education to productive work, one of the priority concerns of UNESCO today and the subject of the International Conference on Education to be held in Geneva in 1981. It also attempts to reduce the problem of employment of college graduates in both quantitative and qualitative terms.

In the quantitative domain, the lack of forecasts of manpower needs and the pressure of social demand for education creates the push for higher education. The reasons for such social demand are varied. The supply becomes more than demand in some areas of studies, whereas financial and other limitations stand in the way of development of other areas of studies which are production-oriented and in which there is more demand than supply. The role of cooperative education in this domain is limited, except that such education could provide better guesses about the demand because of the involvement of the institutions of employment which generate this demand.

In the qualitative domain, cooperative education can play an important role in reducing the problems in the areas identified above. First, involvement in working life during the academic career provides school-leavers with orientation about the world of work and reduces the stress that a new graduate from an isolated education system can experience on his or her arrival in the world of work. Second, cooperative education can provide knowledge about the functioning of the labor market, the role of trade unions, and the recruitment practices of the employers. The attitudinal skills needed in the labor market have already been acquired in the school system. Third, the knowledge about the reward system of the labor market can play a role in channeling the students in the right direction. Fourth, the already established contact with employers reduces the problem of placement of graduates. Fifth, the academic programs of the educational system have the possibility of improvement from the feedback received from the enterprises in which the cooperative education work programs took place. Sixth, through the programs of cooperative education, accountability of the education system to the community and society at large can be demarcated and established properly. One has to take note, however, of the conflicts in the objectives of education: on the one hand, the moral and ethical objectives, and on the other the materialistic, skill-formation objectives, especially in the context of a developing country.

Developing countries face some other problems in implementing cooperative education programs even after the attitudinal problem has been settled. These are as follows:

(1) The most important problem is the lack of a sufficient number of workplaces for the students. The organized sector of employment is too small to accommodate working students in these programs.

(2) Although many of the employers in our surveys indicated that they would like to cooperate with educational institutions, they in fact hesitate and find difficulty in doing so because of lack of physical facilities and also because they think that the students will interfere with the work environment.

(3) The educational institutions are not yet equipped with administrative infrastructures for organizing such programs with institutions of employment.

(4) The traditional concept of an educational institution still finds its expression in integrating programs of education with work programs.

Whatever the difficulties, it now appears that conditions are becoming increasingly favorable towards integrating education with relevant work experience. Evaluation of some of the cooperative education programs undertaken in the West demonstrates their merits. It is hoped that with support from the public and the government, such programs will be undertaken more and more in the educational institutions of developing countries, thus bringing the institutions of education closer to the institutions of employment.

SESSION 20: FOREIGN STUDENT VISA REQUIREMENTS

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A student must have sufficient funds either by a grant, scholarship, fellowship or from personal resources for all expenses for the entire length of their academic objective, including return abroad. Under no circumstances should a student be issued a visa if payment involved involves working off campus to help with expenses.

E students, upon completion of their academic objective may remain in the United States for periods of practical training recommended by their institution or their host institution.

For F students the Immigration and Naturalization Service may grant permission for a maximum of not more than twelve months of practical training.

And for the J visa the exchange or the program sponsor has the authority to grant permission for a maximum of not more than eighteen months of practical training. It should be limited to the time actually needed for the type of training required to round off academic studies, providing the training is not available in the student's home country.

A student is categorized as such, not as a trainee, and is verbally described as engaged in training on the IT66 Form which is used for the J visa. Students with an F visa must obtain permission for part-time off-campus employment from the Immigration and Naturalization Service. Program sponsors can authorize employment needs within the limits defined in the regulations for students on J visas. A student enrolled in a full course of study may be employed on campus in conformity with the terms of a scholarship, fellowship, or assistantship if the employment is related to his course of study. No authorization by the Immigration and Naturalization Service is needed, but such employment must have the approval of the exchange or the program sponsor. A student does not require Immigration and Naturalization Service permission to accept any other kind of on-campus employment which does not displace a United States resident. Due to unforeseen circumstances which may arise subsequent to his or her entry as the J-1, a student may be authorized to accept off-campus part-time employment not related to his course of study. This permission should not hinder the student's ability to successfully carry a full course of study. Part-time employment means a student may work off-campus up to twenty hours per week while school is in session, and full-time when not required to attend school. A student must terminate such employment as soon as the need ceases.

Dependents of an F-1 visa holder may not accept employment or engage in business under any circumstances. Dependents of J-1 visa holders may apply to the Immigration and Naturalization Service for permission to work. The employment authorization will only be granted if it is for the support of the J-2 spouse or dependent children and not to help with the support of the J-1 student. Students on an F visa that are in the United States will not be permitted to change classifications. The sole purpose is to permit the spouse to work. Permission to engage in any employment is automatically suspended while a strike or a labor dispute involving a work stoppage or lay-off of employees is in progress in the occupation and at the place at which the student is employed. A J visa holder must suspend employment immediately if such a situation arises at the place of employment.

Cooperative education laws are the same for the F and the J visa holders, and enable the individual to gain first hand on-the job opportunities to continue his work-study program. Exchange visitors on cooperative education programs are classifiable as students. Trainees may enter the United States temporally on an H-3 visa or a J-1 if the sponsor has or changes a program designation that covers that proposed activity to utilize the J visa at the invitation of an individual organization, firm, or other trainer for the purpose of receiving instruction in any of the fields of endeavor.

The standards of admission will be based on the kind of training to be given, the number of hours that will be spent respectively in classroom instruction and on-the-job training without supervision, the position or duties for which this training will prepare the participant, the reasons why such training cannot be obtained in the person's country and why it is necessary to train in the United States.

Common characteristics of both H-3 and the J-1 visa or training type of non-immigrant visa are: a) the trainees have no intention of abandoning their foreign residence at the time of application, b) they are entering the United States for the primary purpose of pursuing the specialized training program, c) both visas require compliance with the annual alien registration requirement, and d) both types of visitors may receive compensation for their services.

The differences between the H-3 and the J visa are as follows: a) If a trainee with an H visa meets legal requirements, the trainee may later apply for an adjustment of his or her status in the United States, in order to become a permanent resident, subject of course to the general laws and regulations currently enforced regarding immigration. You should contact the Immigration and Naturalization Service for the specific information regarding the individual. The trainee admitted on a J visa, who has acquired J status after entry, is subject to the two-year foreign requirement and must satisfy that requirement before he is eligible for reentry into this country as a permanent resident or as a non-immigrant with an H or an L visa. b) The spouse of a trainee with an H visa may not engage in employment. The spouse of a trainee with a J visa may engage in employment only if the permission is granted by the Immigration and Naturalization Service. c) The length of stay in the United States for trainees with an H visa is not limited to any specific time, but a trainee with a J visa is limited to eighteen months. d) The responsibility of an institution which sponsors a trainee of an H-3 visa makes it possible for the individual to undertake the training program agreed upon, and the trainee on the J visa has the responsibility to insure that the respective program of the participant is in accordance with the stated objective of the exchange visitor program as described at the time of the designation. As a general rule the J visa, when used for training, should be used in cases: 1) where they are government financed, U.S. or foreign; 2) where they are subject to the two-year foreign residence requirement by virtue of the exchange visitor skills list; and 3) where the institution provides a substantial amount of the overall cost of their program and where the institution also assumes an obligation to encourage the trainee to return after he completes his program.

Neither the H-3 or the J visa should be used for the purpose of bringing temporary workers to the United States. The J visa should never be used for the purpose of filling staffing vacancies, employing cheap labor, or circumventing other laws and regulations such as the Immigration and Nationality Act and the Department of Labor certification required in the cases of temporary workers coming to the United States with an H-2 classification.

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I am going to talk about work permits rather than visas, because this is the particular mechanism that we use in Britain, and indeed in the rest of Europe. A visa is the entry stamp in the passport that is required for certain people coming from countries particularly in the Eastern block, but it does not have any bearing on ability to work or not. What is needed for work purposes is a work permit, and the government authority which issues work permits in the United Kingdom is the Home Office, whose responsibilities include immigration and matters pertaining to the police, and home security. There is another government department involved too, which actually implements the legislation that has been devised by the Home Office, and that is the Department of Employment.

I work for an organization which is funded by the U.K. Education Department. We are responsible for developing international exchange programs, and for acting as an advisory facilitative service for British institutions, individuals, and local authorities that wish to internationalize their activities. We run programs for faculty exchange and for student exchange, so we come into contact and sometimes into conflict with the legislation connected with bringing people into the U.K. When there is an obvious area of confusion we try to clarify it with the relevant government department, either the Home Office or the Department of Employment.

Now the Home Office is the government department which actually makes the legislation on immigration, and this is updated regularly. The last update was in April of last year. Unfortunately, things are not done as openly in the U.K. as over here, and there was no opportunity to comment on the legislation when it was in its draft stages. I had several unsuccessful attempts to meet with Home Office officials on a number of points relating to faculty and student exchanges, but we were told rather categorically that because the legislation was in its draft stages this would not be possible. We could discuss it once it was all cut and dried and had passed through and there was nothing that could be done about it.

The work permit that is needed for employment in the U.K. comes under two categories. One is a permit that is issued to foreign workers who fall into a shortage skills sector. But the type of permit we are more concerned with is that issued under a piece of legislation called The Employment of Overseas Workers: The Training and Work Experience Scheme. This is the category under which all student applications fall. Once the legislation and the terms of reference have been passed through the Home Office, the Department of Employment then issues an OW22 form (Overseas Worker Number 22), which has to be completed by the prospective employer in the U.K. It is then sent to the student before he has left his home country. When he comes into the U.K. he brings the permit that has been issued by the Department of Employment, and his passport is then stamped "Employment Restricted." This means that, subject to certain conditions, if he has the work permit from the Department of Employment then he is able to take up employment. The student does not receive the stamp which anyone else would receive which says "Employment Prohibited."

It is particularly unfortunate that we do have these very stringent conditions and that there are so few categories of exemption, because my organization is funded by another government department to actually develop reciprocal exchange programs, which entails bringing people in, and this is made rather difficult when the legislation made by the Home Office seems designed to prevent people from coming in. The Home Office is also reluctant to multiply exemption clauses because it points out that immigration officers at Heathrow and Victoria Station would become confused. But there is already some confusion. It is not unknown for two students coming in on exactly the same program and going through different gates to have totally different stamps entered and to have totally different questions asked, nor for a plane load of exchange teachers coming in all on the same program to go through different channels.

The OW22 form issued and validated by the Department of Employment is the instrument necessary for bringing cooperative education students over. The main difficulty that we have encountered is the length of time needed to process this OW22, which can take about two months. Now as your students presumably want to travel the cheapest way over the Atlantic, you will appreciate the time scale we are talking about. The Department of Employment works through its pile of OW22's in date order, and it is difficult for them to pick out those that relate to sandwich education, where there is a certain necessity for the student to book his flight. In the last round of meetings I had with the Department of Employment we did agree, however, that any applications that had written across them in bold letters SANDWICH STUDENT APPLICATION would be picked out fairly readily.

We have agreed now with our European Economic Community partners that work permits are not necessary within the community, and of course mobility of labor and freedom of movement is one of the cornerstones of the whole idea of the Common Market. But Greece still does not enjoy this facility, and it will not be until the late 1980's that Greek students will be able to come into Britain or British students go into Greece without a work permit. The fact that not even the pressure of the European Community can convince us that the Greek student should be admitted does not really auger very well for any relaxing of the legislation in other directions. Unfortunately in times of economic hardship and recession everybody gets a little paranoiac about bringing in foreign workers. There is straightaway the image, particularly in the minds of Home Office officials, that any of your students is going to come over and take work from a British national. No matter how much one says that that student has to return home, that it is part of a reciprocal agreement, that we are sending a British student abroad, this does not seem to carry very much weight. They still see it as being back door entry, and they think that any sort of relaxation in the regulations will be abused. This is why the regulations have become harsher over recent years and are being applied with that much more severity.

Certain programs do have special permission to bring in foreign students without completing the OW22 form. One of them is the British Universities' North America Club. American students who come in on this program can be issued a Blue Card, which enables them to enter Britain without necessarily having a specific employer lined up. They can enter in the knowledge that once that employer has been identified, they will be able to take up employment for a specified period of time without having to go through the hassle of changing status with the Home Office.

The other main organization is IAESTE, the International Association for the Exchange of Students for Technical Experience. It is an international network that operates in up to fifty countries for exchanging students for work placements, and in each country it is a prerequisite for setting up the national office that the committee in that country should have the ability to bring students in either by issuing its own work permits or documentation in lieu of work permits. In Britain we can bring in students for periods not exceeding three months, and we can issue our own documentation which students must show on the port of entry into Britain, and which will enable them to come in and take up work placement as part of this program without having a work permit as such.

I asked the Home Office some time ago if we could extend this permission, because a number of students, particularly from North America, come over on cooperative education placements of six months, so that three months is not really sufficient. As I was told that they rather regretted ever having given us permission for three months I did not press the point, though there are a number of ways around it.

One is to persuade your student that to all intents and purposes he is taking an extended holiday in Britain, and that is why he is not returning home at the end of three months. Obviously there are risks in bending the legislation like this.

We make it difficult too in that we require any foreign nationals apart from Commonwealth nationals to register with the police in the U.K. Usually this is when they have been in the country for six months, but sometimes it can be after three months. Because people are not required to have ID cards in the U.K., this supposedly provides a means of knowing where any foreigner is at any given time. In fact, of course, it does not do that, because one could be anywhere in the country although one has registered with the police.

There is an administrative fee of nineteen pounds per head incurred when one registers with the police. This is not really conducive to promoting international relations, especially for a family coming into Britain. I have taken this up with the Home Office, again without success. Now if one has tried to circumvent the legislation on the work permit, or if one has used the IAESTE documentation to stay for six months instead of three, obviously one is running a slight risk because if the student should become involved in any matter, however minor, the police have the registration and can make further inquiries. This could make life rather difficult, so it is not advisable to try to bypass the regulations.

There are one or two other categories of exemption from this work permit. There is a special program for bringing in young agriculturists. Here the sponsoring authority in charge of this program issues documentation in lieu of work permits. People coming in as au pairs for some reason do not need work permits. But unless the student has come in through one of these channels he or she still has to get a work permit, and it does not matter if the employment in the U.K. is paid or unpaid.

I wish I could say that the future looked brighter. All I can say is that we can, I think, improve on the way in which the existing legislation is implemented through our friends in the Department of Employment. I also want to set up another meeting with the Home Office to see if the very small number of students who do stay longer than three months might perhaps be treated again as a special case and have their permits extended quite readily.

Much of the legislation that effects both foreign students coming into Britain and British students going abroad was designed for professional workers, not for students, and students have to be slotted into the existing regulations which were never designed for their needs in the first place. Perhaps we do need to have some specially recognized status for the international cooperative education student. This might solve some problems. It would be very nice to think that we would not even have to bother with work permits for this category of student, but I am afraid that that day is some way into the future.

SESSION 21: EMPLOYER GOALS AND PROGRAM DESIGNS

William J. Sloboda
President, New York Board of Trade
United States

Employers are looking right and left for people to hire. Plenty of people out there want to work, and there are jobs to be done that go begging. But the three do not necessarily jibe. Employers and educators have to combine energies to create a meaningful partnership which will stop the erosion of our educational system and bring about a new era of caring about young people, about their being educated, about the contribution they will be able to make to society as well as to the business community by providing the positive human resource which is essential for its survival and growth. I hope my presentation will convince you of the businessman's deep concern and his desire to help, and will motivate you to join us in a new partnership.

Our goals are two: job-ready graduates and a cooperative relationship between business and education. First of all, by job readiness we mean readiness at the level which is accepted by the business community in which that student seeks employment. The student must be able to meet the standards of hard job-related skills and soft interpersonal skills established by the employer. We also want this person to have the background that will enable him to grow to his fullest potential. This the educator can do.

Secondly, a gap has grown between the business and the education communities, to the detriment of all involved. Every day we see the gap between job requirements and the available skills widen, creating not only a feeling of despair among young men and women but costing business thousands of dollars each week for in-house training programs. Add to this the cost of lost productivity caused by the lack of adequate skills, and you will see why we seek to establish a cooperative relationship that will result in a curriculum more finely tuned to modern business needs. We want a relationship which provides timely implementation of needed curriculum changes and is sensitive to the changes in the business community which call for new skills. An active, mutually supportive partnership will enable educators to know what to teach their students for today's positions, what standards to enforce, and what the students will need in the business world two, three or four years from now.

In New York City I have found the business community extremely receptive to working with educators and, through a variety of programs, with the students. The cooperative education programs I have seen in action take many forms. They all, however, have one thing in common, namely that there are two distinct and separate segments operating within the program. On one hand we have the educators and the students, and on the other we have the employers and the students. And although they are part of the same program, each really operates independently of the other.

In this scheme, educators seek to provide valuable training for students; promote self-esteem; assure job placement for graduates and hopefully get private-sector support, either in direct dollars or in leverage during negotiation time with the Boad of Education or other controlling bodies.

On the other hand, in this scheme the businessman seeks to perform his community obligations. He hopes to identify and then get first crack at hiring any outstanding students. Finally, he hopes that the involvement will result in a change in the educational system that will stem the erosion.

Let me cite a few varieties of programs that fit the description I just outlined:

--cooperative education programs, where the student alternately spends time in school and equal time in paid employment in the private sector;

--one day business workshops, which are usually a part of business careers schools where the student will spend one day a week or one day a month on corporate premises to learn to relate what is being studied in school to what is taking place in the business world;

--city-state-federal youth and adult training programs sponsored and administered by school and/or community groups;

--"Adopt a School Program," in which companies target a specific school with which they will undertake a series of programs designed to attack the problems existing in that particular school. These programs address everything from drugs, juvenile delinquency, funds for sports, to reading and math deficiencies.

Are these programs working? Are the program structures effective? Are there any impediments?

Educators will tell you that a representative from the high school or the college is meeting with employers, introducing and establishing programs in the organizations; that students are given the pre-graduation opportunity to get work experience; that students obtain entree to a corporation without having to take and pass a battery of employment tests; and that more often than not, students get employment with one of the companies upon graduation.

The businessman sees it this way. He has contact with the school's job developer, a very pleasant person, but still a salesman who calls only when he has a product, the student, to sell. The businessman is employing the student because he really wants to do his bit to improve human resources. However, he knows that the student will be on payroll for a short period of time and may not be back. Because he has no guaranteed continuity, he does not have a finely-tuned, coordinated training program tied to the student's career path, to teachers and advisors, nor even to his own company's long-range needs. As a result the student, more often than not, is used where needed, placed where there will be the least upsetting of the office routine. There is not real job training and the person ends up no more qualified than before. Consequently the student never really gets turned on, never gets deeply committed, because there is no reinforcement with advisors and teachers.

Most often, advisors and teachers do not follow up to review the student progress, to find out what skills are needed and whether their curriculum is in tune with the business and the particular job responsibilities of the student. The usual contact is an evaluation form received when the student returns to class asking the teachers to rate his or her performance as satisfactory or unsatisfactory.

Employers feel that students cannot be the conduit between business and education in such matters as curriculum and standards. The programs are working, but primarily as window-dressing. Therefore, if we are to have meaningful work programs, we must make four program design changes.

First, we must initiate extensive and on-going involvement between the business community and student advisors. If the educational system is to turn out job-ready students, advisors must have first-hand knowledge of the market. They must have searching sessions with students after each job experience to determine the degree of success of that experience and to counsel accordingly. Finally, the advisor must evaluate whether or not the employer is providing the agreed upon atmosphere and training.

Our second program change must be to see that teachers of hard skills have on-going involvement with the business community so that they, too, are aware of changing skills requirements. This will enable them to anticipate future changes, and react or plan accordingly. If we are using space age words and techniques, educators need to be right there with us.

Thirdly, program design must indicate the specific training program to be used on the job. In that way, the employer will be working in concert with the educator and will be reinforcing the student's career design. Then, and only then, will the cooperative education program experience be a series of the reinforcing success opportunities which are all-important in creating self-confidence.

Fourth, there must be classroom participation by the employer. Experience has shown that at such sessions students are eager to speak their minds no matter how challenging or argumentative they may be. The business executive usually responds honestly and with vigor. A bridge is created and real strides can be made with mutual respect which results from these meetings.

Programs that include these four points will build a bridge of mutual respect and cooperation between business and education. They will create the kind of cooperation we need if we are to expect positive development and utilization of our human resources.

I would like to relate briefly four activities in which my own business constituency is involved. These activities are intended to help meet our human resource needs, to address the declining age groups first entering the labor force, and to build a bridge between business, education and labor.

The first is the sponsorship of a business/education conference, the primary purpose of which is to create a dialogue with the educational community and to begin an active partnership for the future improvement, upgrading and delivery of career education. We will invite participation from personnel vice-presidents and other appropriate officers from a select group of the "Fortune 500" corporations and from representatives of the National School Board Association, superintendents of schools, and those responsible for test evaluation.

Next, we will create a Business-Labor-Education Council. Business is effected by the output of the educational institutions. Labor is vitally concerned about the impact of the educational process upon its members and their children. Educators have the prime responsibility for developing the potential of young people and increasingly, through community colleges, the task of educating the adult population. All three are interwoven into the economic system in which the strengths of each and the strengths of the whole are totally interdependent. The interrelationship among these three sections seems obvious, yet no vehicle presently exists to join their individual efforts in an attack upon the problems of entry level skills, unemployment and underemployment. The Business-Labor-Education Council is designed to provide the structure, motivating organization and talent necessary for such an attack.

Our third activity is a cooperative program between business and education to develop a strategy for upgrading human talent in the private sector. The hidden, unreported and often unrecognized underutilization of human resources is one of the most serious social and economic problems confronting our nation today. This happens because the employee is unaware of career pathing opportunities and the training needed in order to seize the opportunities. In turn, management's unawareness of career pathing prevents effective interviewing and counseling of employees.

Many employees, particularly in lower echelon jobs, perceive that they are locked into positions that do not provide them with access to upward mobility and its derived social and economic well-being. This will continue to work against the employee, the employer and the total economy unless we can improve the establishment and dissemination of meaningful career pathing, evaluation, supervision and training techniques. Career pathing, as we use it in this program, identifies the sequences of responsibilities, opportunities and options that move an employee upward within the company. The concept offers progress within a specific career track and provides lateral moves that can take the employee to a different career better suited to his objectives and interests.

Finally, the New York Board of Trade has begun at the high school level what it calls the "Adopt Your Future Employee" program. This will allow business and education to provide reinforcement, recognition and career counseling to students; a conduit to and from the business community for the students; and a means by which students can identify their professional/industry interests. Executives from these professions/industries will then participate through lectures and counseling directly with those students who have indicated an interest in their business. The program will further provide for an interfacing and exchange of counselors and teachers with their corporate counterparts--in short, a real opportunity for business input into the educational process and for interaction with educators. From this we can develop a positive acceptable employee base.

Our experience has shown that when business gets involved, the process works. Together, we can make it work better.

Ken Hart
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I shall make the presentation that Dr. Christopher Wilson would have had he been here. I intend to focus my remarks on the U.K., since a number of the developments that are taking place at home are closely mirrored in other countries. As such, I hope that my observations will be both relevant and helpful on an international plane.

It may interest you to know that a lively feud still persists between the English and the Scots, both of whom claim to have initiated sandwich courses way back in the nineteenth century. One fact, however, is quite clear. By the turn of the twentieth century sandwich courses were widespread and well established in various parts of the U.K. But although well established, the movement progressed quite modestly right up until the 1960's. There was very little coordination; the main driving force came from the tutors in the colleges offering sandwich courses. Therefore their best endeavors were, on the whole, small scale and localized, quite entrepreneurean, positive, sincere and competent but lacking cohesive punch. The concept of true cooperative partnership between the colleges, the employers and the state is now gaining ground, but this is a very recent development.

A real boost came in 1963, when the Robbins Committee recommended that the then existing colleges of advanced technology be designated technological universities with powers to initiate their own degrees. There are currently nine of these universities, all offering integrated sandwich courses. In 1966 the government announced the designation of new institutions known as polytechnics. Some 30 of these have been established, also with powers to offer integrated sandwich degrees.

These two major initiatives led to a tremendous growth in the number of students pursuing cooperative degree courses. Their status and recognition improved significantly, and the range of sandwich degree disciplines was extended. By 1973 there were 33,000 sandwich undergraduates, which had grown to 50,000 by 1980, producing about 12,000 to 13,000 graduates a year in our population of some 58,000,000. It is hoped that this progress will not be impeded by the current economic climate.

Due to the way the whole movement developed in the U.K., it is hardly surprising that there are two quite specific differences between the North American approach and the British. The British sandwich degree emphasizes the integrated nature of the industrial work placement. For successful graduation, the undergraduate has to demonstrate a very close relationship of work experience to the subject discipline of the degree course. In the North American system the work experience can be far more general and much less closely tied to the degree specification.

Secondly, in the British system the academic tutor has prime responsibility for the selection of the suitable work placement and for tutoring students during their industrial training periods. By contrast, these responsibilities tend to be vested in the cooperative education departments in the North American colleges, with much less involvement of the academic staff. Both systems work effectively, but perhaps each might still be able with advantage to learn from the other.

When looking for graduate staff in the U.K., however, the employer has not only to face up to the competition in making his enterprise attractive to the number and quality of graduates needed; he also has to contend with the mighty forces of "establishment attitudes and academic integrity." Industry and commerce still have to fight very hard for the graduates they need. Government service, the professions and academia in general traditionally absorb about two-thirds of all those completing first degrees. Many of the rest, particularly those pursuing private study courses at home through the open university, people doing second degrees to help themselves in existing careers or those who are studying for fun as housewives or pensioners, do not swell the numbers of those available for employment.

The second challenge comes from the cherished independence of the academic world, many of whose members seem to rebel at the thought that there should be the slightest connection between education and working for a living afterwards. One result of this is a quite alarming mismatch between the degree courses studied and the needs of industry. The arts and the social sciences still outnumber the scientists, engineers and the numerate disciplines to the extent that one or two large employers in the U.K. could virtually take the total crop of electronic engineers every year without other companies having a look in. The sandwich course lends itself particularly well to those disciplines where the scarcity factor hurts us most, in engineering and technology, natural sciences, mathematics and computing, although the range also extends to administration, business studies, environmental health, medicine, and various professional and vocational disciplines.

The need factor alone thus justifies and in part explains the growing importance of the sandwich graduate in the U.K. It has also given added impetus to the better coordination of the whole spectrum into a cohesive pattern which much more closely resembles the North American cooperative education network. Officialdom also brings pressure to bear on the employer with regard to his standards of selection and subsequent training of students. Under our labor legislation, dismissal of a student or failure to offer employment after graduation can involve a great deal of management time and the payment of sizeable money compensation. We also have industrial training boards who lay down standards and requirements relating to the type, amount and quality of training provided. They impose substantial levies on companies if they do not meet requirements and give them rebates if they do. All of this reinforces the employer's goal to choose "right people" before he or she starts to give them the right training.

The steady growth in recent years in the number of sandwich students hired is proof positive that they contribute towards the achievement of business goals. It would be less than fair, however, to rest the case there. Through their industrial training, selected students are given practical exposure to the real life standards, practices, and requirements of a particular industry or employer. By graduation the student already has up to eighteen months of actual work experience in the organization, which reduces the non-productive post-graduate training period to a minimum. Secondly, young, high-class minds unfettered by inhibitions of past experience can introduce fresh thinking, and as an academic I wonder how often employers take advantage of that. Thirdly, through the tutors the employers can discuss new or changing requirements, which often leads to degree course syllabus changes both earlier and more effectively than would otherwise be possible. Fourthly, a training program gives the employer a golden opportunity to observe a potential employee under working conditions, while the student has the same chance to assess a four-year degree course.

We have in the U.K. course designs or calendar patterns with almost infinite variations on how the total four-year span is divided between college-based periods and work-experience periods. There are two popular versions, the first being years one and two at the college, year three (which is sometimes 15 months if you include the two sets of vacations) in industrial experience, and year four back at the college. That is described in the U.K. as a thick sandwich. The full-time universities also call their programs thick sandwiches, where you have a period in industry for one year, a three-year full-time program, and then a year of post-graduate training.

The other version is six months of work experience followed by six months of college study in each of the first three years, followed then by a full year of college in year four. That is the thin sandwich. There are those who argue for the more lengthy and sustained experience in the former model, and those who advance the benefits of flexibility and breadth which the latter offers on an ascending maturity and knowledge base as the student progresses through the degree course. It is right that this choice exists. No one pattern offers a universal answer.

Finally I would like to describe student sponsorship by Dr. Wilson's company, International Computers Limited. For some years now we have regarded our sandwich graduates as a full and equal element of our annual graduate intake, which has been running at an annual total of between 450 and 600 graduates. We have had students in most disciplines, including accounting, personnel, business planning and administration. Primarily, however, the emphasis lies strongly on electronic engineering for our manufacturing research and development units, and on computing for sales support activities. As a high technology company we prefer the simple 12 to 15 month training period, because this fits in better with the nature of our work. Students need this time span to become really proficient and to see major projects through to completion. On the engineering side we have largely stayed with full four-year sponsorships, sponsorship meaning at least a financial bursary of some kind through the whole program and guaranteed training during the cooperative periods. Students are selected from their final year at school and receive modest bursaries for their first, second and fourth years plus full pay for their industrial experience. This gives us an unfailingly high rate of successful post-graduate appointments, and the scheme continues to serve us and the students very well.

By contrast to this we have been moving steadily towards industrial traineeships for other parts of the business, where personal qualities, skills, and maturity are particularly crucial. College-based trainees are selected towards the end of their second year. They are offered industrial experience for their third year, and if the marriage is successful, we pay them the same modest bursary for their fourth year before employing them after graduation. The major advantage of this scheme lies in the added maturity of the students before we select them.

Sandwich training, as you can see, is thriving in the U.K. notwithstanding the problems from the current economic environment. The movement is developing quantitatively and qualitatively to help employers meet their manpower goals through program designs that are as many and varied as the marketplace can accommodate. With the establishment of ASET (the U.K. Association for Sandwich Education and Training) in 1979, we took yet another major step forward in the formal interrelationship between employing organizations and the academic institutions. Doubtless, with some of these national emphases still continuing, I believe that ASET will take us much nearer to the sophisticated, cooperative education system you enjoy in North America.

SESSION 22: TRAINING FOR EMPLOYMENT MOBILITY

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Why has mobility become such an important issue in our modern society? A few decades ago, people did not think of mobility as they think of it today. Until recently, occupational profiles were rather stable. People did not change their occupation nor their employment as frequently as they do today. Indeed, having acquired certain skills was, for many who had found a job, almost a guarantee of lifetime employment. Career advancement was basically linked to seniority and experience rather than to the acquisition of additional knowledge and skills. Movements from rural to urban areas and from one country to another were limited and the pace of technological development was much slower than at present.

The world in which we live today is quite different. Structural changes are affecting the economic scene in both industrialized and developing countries. Some of the labor-intensive industries are declining or disappearing in the industrialized countries while other new, more sophisticated and capital-intensive industries are being established. There is marked expansion of the tertiary sector at the expense of the agricultural and industrial sectors. Indeed, many of the industrialized countries are moving into a post-industrial era in which the demand on some occupations is declining and on others it is increasing rapidly. People who lose their jobs as a result of these changes have to acquire new skills and knowledge if they want to find other employment.

In developing countries the situation is more difficult to describe because of the great diversities among these countries. Generally speaking, however, all sectors of the economy are subject to far-reaching changes. Thus, raising agricultural production, developing agro-based and agro-related industries and providing both physical and social infrastructures such as housing, water and power supply, rural works, transportation and communications, storage and marketing, health services, education and training are requiring different skills than those existing at present.

Enhanced efforts to industrialize developing countries and rapid changes in the quickly growing services sector, both public and private, are requiring new skills and more sophisticated knowledge. Because these changes are dynamic and continuous we have to expect more spectacular changes in the future, and a greater need for mobility.

Technological developments are another factor affecting mobility. Although the consequences of technological developments and automation in the last 25 years have been less dramatic in industrialized countries than was feared, the labor saving impact resulting from the change from mechanical to micro-electronic technology is likely to be greater and will affect not only unskilled and semi-skilled workers but also highly qualified manual and non-manual workers as well as management staff.

In developing countries various technologies exist and compete at the same time. These range from the most primitive to the most sophisticated. Yet, the trend towards modernization, automation and the development of new processes is clear. Countries such as Argentina, Brazil, Egypt, India, the Republic of Korea, Malaysia, Mexico, Philippines, Singapore and Thailand, as well as many of the OPEC countries, are already introducing new technologies at an accelerated pace.

The consequences of the introduction of technological development are striking changes in occupational structures and technical qualifications. The large-scale technological changes in the 1950s and 1960s have resulted in a decrease in the proportion of unskilled workers, while that of skilled workers, particularly in the maintenance sector, has grown. The demand for technicians, engineers, scientists, administrative staff and managers has substantially increased. The impact of the introduction of recent technological developments such as micro-processors or occupational structures is still uncertain. What is certain is that occupational profiles are changing rapidly; some skills will no longer be required, while others in offices, workshops and laboratories are emerging. Probably a much higher proportion of staff will be involved in managerial, marketing, design and higher technical responsibilities, while a smaller proportion will be engaged in manual skills.

There is an increasing need for multi-skill qualifications. Good technical knowledge and related theoretical knowledge, speed, accuracy, capacity for sustained attention and quick reaction, flexibility, logical thinking and reasoning and organizational abilities are of particular importance at all levels of skill from the worker to the top manager. Social skills, such as the ability to communicate and the ability to adapt and cooperate where team work is required are also in great demand.

In short, the labor market is today employing a completely different type of person with different qualifications and qualities. However, this is only one side of the coin. The other side is the aptitudes, aspirations and perceptions of the people themselves. This is the most important aspect of mobility. Three out of every four persons who enter the labor market for the first time at the age of 18 will change their employment and often also their occupations before they reach 25. A large proportion of the labor force change their employment three to four times during their working life. Too often today young people discover after several years of work that they have made the wrong occupational choice, have chosen the wrong employer, want to move from the place where they live, want to develop their career or simply desire more personal satisfaction. As a result, mobility has become one of the major elements not only in employment but also in training policies. This has been the case in the United States for a long time. Western Europe and many of the developing countries are following suit. The only exception is Japan where the concept of lifelong employment is still the basic philosophy. Improving horizontal mobility is therefore an important element in the employment policy of Japanese enterprises.

Equally important is the vertical mobility of manpower. The vehicle for achieving better living conditions and higher incomes is career advancement. Seniority and experience are no longer sufficient. Training and the acquisition of additional knowledge and skills are as important today as seniority and experience.

Do our education and training policies, our systems and programs enhance mobility? Are they capable of adapting themselves to the changing needs of our societies?

Before answering these questions let us recall some of the major objectives of training. From the economic point of view, training should provide the qualified manpower the economy needs. It should provide people at the right time, with knowledge, skills and attitudes which enable them to produce goods and services. It should raise their productivity, contribute to maximizing profits of undertakings and thus contribute to general economic development.

From the social point of view, training should help people to break out of the poverty trap by improving their ability to choose an employment freely and by increasing their mobility; by protecting their employability and reducing their vulnerability to unemployment; by opening the door for career development, job and personal satisfaction; by promoting self-reliance and self-respect and by unlocking the potential for an improved quality of life.

These objectives are recognized and accepted both in industrialized and developing countries. Achieving them, however, is another thing.

The major issues lying at the heart of the problem have not been resolved and other important issues, previously considered marginal, have moved to the top of our list of concerns. In a large number of industrialized countries where universal basic education has been achieved the problem is no longer one of quantity but of quality. Never before have so many young people left compulsory education without successfully completing the educational cycle; never before has there been so great a need to organize remedial courses in subjects such as languages and simple mathematics for trainees enrolled in training programs. The feeling in industrialized countries is that the school system is no longer responding to the rapidly changing socio-economic environment. Science and technology are developing at an unprecedented pace the social relationships are undergoing dramatic changes. Yet the school of today is still catering to yesterday's society.

Thus the problem beings with the school and extends to the training system. Complaints center around questions such as the inability of training systems to absorb all those who need basic training, the adaptation of that training to different needs of new target groups, the content and duration of training, and the role distribution in training between schools, training centers and enterprises.

The problems in developing countries are more complex. The inherited school system is unable to cope with the requirements of the newly independent states. Schools transplant values which are alien to their culture, and they prepare people for administrative and white-collar jobs in government departments and ministries rather than for the blue-collar jobs which are needed for economic development. In short, there is a complete divorce between the school and the world of work.

Training systems in developing countries are no less open to criticism. Generally speaking, developing countries are giving high priority to training in the modern sector, and within this sector preference is being given to manufacturing. Training in rural areas, however, has been neglected for a long time, and existing training programs for these areas are so scattered and fragmented that they cater to only a very limited number of rural people living in the vicinity of urban agglomerations. In some countries it is difficult even to obtain any initial training without being sponsored by an employer. Restrictions such as high entry requirements, sex preferences in certain occupations or language barriers are often additional constraints. Indeed, training systems tend to become elitist systems to which only the privileged have access although it is considered a second-class education compared with an academic education.

We can see then that existing education and training systems are outdated. They are reacting very slowly to the rapidly changing needs of our societies and they are still geared to a large extent to one-time training for a lifetime employment.

Given the situation which I have just described, what changes must we introduce into our education and training systems in order to enhance mobility? In other words, how can training contribute to employment mobility?

The concept of lifelong education and training is being gradually accepted in the world at large and is being introduced in many countries. This change in outlook and expectations is the first step in the right direction. What does this imply? In the first place it means that a more coherent and flexible education and training policy is needed, a policy which responds to and is flexible enough to change with the needs of the economy and the aptitudes and aspirations of individuals.

Secondly, education and training systems should be designed in such a way that they not only cater to initial training but provide the opportunities for men and women to update and upgrade their skills and knowledge, or acquire new skills, whenever they feel it necessary or desirable. But the existence of such opportunities is alone not sufficient to ensure that people make use of it. It should be coupled with a system of paid educational leave allowing people to absent themselves from work while continuing to receive their salaries. True, in many industrialized countries lifelong education and training systems do exist, but very few countries have introduced a system of paid educational leave to ensure the full utilization of the available training opportunities. Developing countries, however, emphasize initial training for the short-term requirements of the economy. One hardly finds systematic updating or upgrading courses, not to speak of retraining arrangements. If such courses do exist they are usually organized on an ad hoc basis.

Furthermore, many developing countries still consider the concept of paid educational leave to be too expensive and think that it is premature to introduce it. This might be true to a certain extent, but in the medium and long run paid educational leave seems to be one of the most effective ways of encouraging the acquisition of new skills and knowledge during a person's working life and thus enhances both vertical and horizontal mobility.

Coherent education and training policies can only be effective if they are supported by an efficient vocational guidance and counseling system, a system which enables young people to choose an occupation which corresponds to their aptitudes and aspirations and which counsels young people and adults on the possibilities for further education and retraining. Indeed, vocational guidance and counseling should be seen as a lifelong process, as much as education and training is. This aspect is often still underestimated. Vocational guidance and counseling are usually provided at the beginning of a person's working life, precisely when adolescents make their occupational choices, but hardly anyone makes use of the system after that. As a result, opportunities for change are too often missed and dissatisfaction grows.

Another aspect which has to be taken into consideration is the linkage between the educational and training system on the one hand and the world of work on the other. While the basic educational philosophy in the past was to provide education for the sake of education, the training philosophy was in essence more realistic in that it enabled people to acquire the skills and knowledge which brought them employment or self-employment. Indeed, training which was organized along the traditional apprenticeship schemes which we inherited from the Middle Ages was fully oriented towards the world of work. Modern apprenticeship schemes as conceived in industrialized countries are also related to the world of work. But where things go wrong is when this education and training is organized in schools and training centers. Such programs tend to be isolated from the realities of the world of work and are difficult to adapt to changing needs. Unfortunately the trend in developing countries is to organize training courses within vocational schools, with the result that employers increasingly complain about the irrelevance of the training which young people receive.

This brings me to the question of the content of training. Much of the discussion regarding the relevance of the training system is centered around the curricula. Should the training curricula be broad based or job-specific? If training is to enhance mobility, the logical answer is that trainees should receive a broad-based basic training followed by a specialization. Such a policy makes trainees versatile and capable of mastering the occupation in which they are specializing. It gives them a better chance to choose their employment freely and it enables them to achieve their career objectives through upgrading and retraining courses. There is, however, a case for job-specific curricula. This seems to be warranted for illiterates, school drop-outs with limited basic education and unskilled employed workers.

Generally speaking, there is a great need to reform the curricula not only to enhance mobility, but also to check undesirable mobility such as the massive rural-urban exodus which we witness in many of the developing countries today.

To achieve this, the training curricula should be developed in such a way as to enable people to find wage-employment or self-employment. Recent attempts to develop training curricula on a modular basis allow for a more flexible approach to training. Such an approach is practical in cases where curricula have to be revised or adapted to meet the requirements of technological development and the level of education of the trainees.

To what extent does cooperative education contribute to employment mobility? The basic objective of cooperative education is to guarantee a better transition from school to work. It is based on an alternation between school education and training on the job. Looking at the concept more closely, one discovers that co-operative education tries to link education with the world of work. As such it should contribute to improved employment mobility, but this requires a different type of teacher and a different curricula than what we are used to. This is, therefore, where we must begin. However, a small word of warning seems in order at this stage. Cooperative education should not be seen as the panacea, nor should it be seen in isolation. It must be seen within the framework of a total learning system which meets the needs of the economy and the aspirations of people.

In conclusion then, a training system which does not contribute to employment mobility is not worth its name, nor is it worth investing scarce resources in such a system. We still have a long way to go and we have to keep the training system under constant review. We have to introduce changes and reforms whenever necessary. Reforms cost a lot of money, and financial resources in today's world are scarce. However, this should not discourage us from developing new ideas. It is only through change, adaptation and reform that we can make progress.

SESSION 24:
MANAGEMENT AND TECHNOLOGICAL TRAINING NEEDS IN DEVELOPING COUNTRIES

Irene Lorenzo
United Nations Industrial Development Organization
Austria

My purpose is to briefly acquaint you with the prevailing situation in some of the developing countries and to outline a few specific opportunities for industry/education linkages in the field of industry.

Economic growth and the drastic economic and social changes brought about by scientific and technical progress have been and continue to be the causes of an enormous problem of adaptation for the developing countries. The frustration of the past and the hopes for the future have led to an awareness of the need for a new set of international economic relationships that would facilitate the implementation of relevant national policies for economic and particularly industrial development. The need for improving social control on technology transferred from the industrialized countries arose initially as a manifestation of a political will to put an end to weak relationships of interdependence at all levels. Against this background a concrete formulation of industrialization objectives was articulated in the Lima Declaration and Plan of Action, which emerged from the Second General Conference of UNIDO in 1975. The Lima Plan called for, inter alia, national and international efforts to achieve a target figure of at least 25% of the world industrial output by developing countries by the year 2000.

Moreover, a number of resolutions in the United Nations General Assembly, the Industrial Development Board, and the Lima Declaration and Plan for Action have been concerned with the expansion of activities for training personnel for industrialization. More recently the New Delhi Declaration and Plan of Action was adopted in January 1980 to provide high priority to the development of human resources. It made a number of mutually supporting recommendations for action by the developing and developed countries as well as by UNIDO.

The quest for a new technological order forms part of this development effort. For the developing countries a new technological order would imply the promotion of technology as a development variable--a variable in the sense that there are alternatives and options, and in the sense that it should be an objective entailing the acquisition of levels of competence and know-how that will guarantee a certain degree of independence and enable self-determined needs to be met.

Success in industrial development depends largely on the availability at the appropriate time and place of workers with certain skills. Since the cost to developing countries of generating such skills is generally high, the provision of too much training in some skills and too little in other creates unnecessary burdens. In many cases it is cheaper to train local labor than to recruit foreign workers. It is therefore essential to estimate skill requirements in setting goals for industrial education.

In many of the developing countries, the shortage of qualified manpower has been a major handicap in promoting and sustaining development efforts in the field of industry, although one of the salient features of development projects during the last three decades, and which is still dominant at the present time, is the emphasis given to industrialization. This shortage is aggravated by the migration of trained personnel from less developed to more developed countries--the brain drain--and by the inefficient use of skilled workers within the developing countries.

There is, however, growing realization in the developing countries that the main impediment in achieving economic growth is not the scarcity of natural and material resources but the failure to effectively and optimally harness the vast human potential. Human capacity is highly flexible and can be developed through appropriate motivational and training interventions.

The process of industrialization has created urgent needs for specialized skills at all levels that cannot be satisfied by the existing educational system. Indeed a common complaint of employers, particularly in the manufacturing industries, is that universities do not produce young people who meet their requirements. This situation has led to the establishment of a great variety of training institutions. Such institutions have been initiated and financed mostly by governments, but industry has also played a part. These institutions range from secondary vocational and technical schools to university or equivalent courses in various scientific and technological fields.

To generate new and specialized skills quickly and economically and to make more efficient use of those available, the developing countries will have to subject their manpower problems to rigorous analysis. There is a general agreement that the estimation of skill requirements present difficulties. More reliable estimates require not only improved statistics and other information on manpower but also progress in forecasting demographic, economic, social and technological factors, all of which affect supply and demand with respect to manpower. For these reasons it is unlikely that any present estimates of industrial skill requirements, in particular of long-term requirements, will prove accurate. They may, however, indicate which needs are more pressing and may serve as an initial basis to encourage cooperative education programs.

Industry is a promising source for the identification of educational training needs, more particularly to identify the occupational skill profiles associated with possible technologies and a description of non-technological managerial influences. The provisions of qualified manpower needed by industry in any country is a complicated process that involved the design and development of training policies and programs. The activities will range from the identification of training needs to the choice of forms of training, the establishment of training facilities, the development of training staff, training standards and the adoption of appropriate and effective training methodologies and techniques.

Training facilities in developing countries are generally not fully utilized, particularly because of the inadequacy of programs in meeting needs of enterprises and the high costs. Industrial enterprises are generally too small to each have its own training program; they are increasingly turning towards foreign sources of technology to meet immediate needs related to specific industrial projects.

The linkage between training institutions and industry leaves much to be desired, so that these institutions generally have an excess structural capacity but are not in a position to meet the needs of industry; in addition, the linkage between enterprises and the education system is weak. The result is that the short- and long-term needs of industrial enterprises are not met satisfactorily by national or foreign training facilities. Also, the lack of solid data describing the training requirements of industrial projects has been and continues to be an important factor which inhibits the effectiveness of the efforts made by the developing countries. Furthermore, the absence of any serious dialogue between educators and those invested with authority over industrial projects has meant that vitally important investment decisions have been made without reference to the availability of the required skills or to the possibility of tailoring the form of the investment in order to obtain a maximum employment effect. Cooperative education my uncover significant possibilities for economizing on training expenditures.

New industries will be established in developing countries, existing ones will be expanded and new technologies will be introduced. Large numbers of people will have to be trained or re-trained at all levels including entrepreneurs, not only for the new and expanding large industries but also for the medium and small-scale industries which are expected to develop more rapidly.

In developing countries, the government plays an important role in industrialization. Officials working as economic administrators not only initiate various development projects but also control the pace of industrial development through allocations of foreign exchange and raw materials and through licensing.

The training of economic administrators has been hitherto closely connected with economic planning. It is being increasingly realized, however, that government administrators require training which will provide economists with a technical background and engineers and technical personnel with an economic background. Higher-level administrative and managerial staff are required for the formulation and implementation of national industrial policies and for the management of individual enterprises. In the latter capacity, they are responsible for policy-framing, planning, organization and management. Stress has recently been laid on the importance of their training for the efficient administration of industrial enterprises.

To meet long-term goals a start should be made in the schools to prepare students, among whom will be the future industrial managers and administrators, for life in an industrial society. It has been suggested that general education courses be revised to include an introduction to industrial problems, and that textbooks and modern methods should be used that take account of the realities of an industrial society.

To meet short-term goals, many countries have endeavoured to make good the lack of executives by establishing a national management development center. Such a center is often the focal point for a series of courses for industrial managers, especially those in large and medium-scale industries. A great deal still remains to be done, however. Many industrialists are not convinced of the value of management development courses, partly because such courses have sometimes been designed with one country in mind but are carried out in other countries in which the cultural and industrial conditions are quite different.

Although UNIDO has not been directly involved in cooperative education programs it has nevertheless given special attention to the industry-university linkages by promoting the contribution of education to industrialization. UNIDO's present work in the area of training is directed primarily towards training in specific branches of industry as well as towards other subjects such as planning, management, investment promotion and project formulation implementation. Under its Field Operations, UNIDO undertakes a variety of training projects in developing countries, especially in activities which contribute to the industrial training infrastructure. These activities may cover:

--design and development of new national or sectoral industrial training institutions, or the strengthening and adjusting to identified needs of existing ones;

--design and development of training departments for governments, pertinent institutions, holding companies or individual enterprises, or making available the services of industrial training experts to such bodies;

--specialized training programs, including the provision of lectures, trainers and training equipment, for specific groups of industrial personnel;

--assistance to national management development institutes;

--organization of industry-university linkages.

Through its in-plant training programs, UNIDO provides training for newly graduated technicians. These in-plant training programs are to be implemented in the developing countries, using indigenous instructors with only minimal assistance from UNIDO. Supporting activities include such activities as seminars, expert group meetings, group training programs, studies and research. These activities are closely related to operational activities and are designed to define and promote specific technical assistance projects. They are also of positive value in accelerating the flow of technical know-how and skills from industrialized countries to developing countries.

In addition to fellowships to attend the in-plant training programs mentioned above, UNIDO operates an individual fellowship program. Approximately 1000 followships are granted each year in all fields of industrial development. One of the major advantages of individual fellowships is the possibility of designing and implementing a training program tailored to the needs of the job the candidate is to fulfill. Such programs are carefully designed on the basis of information given on the candidate, and are implemented and supervised in cooperation with selected enterprises and institutions. Furthermore, it is the policy of UNIDO to place more follows, whether individual or grouped, in suitable industrial training facilities in advanced developing countries, a policy that helps to promote closer technical cooperation among developing countries.

UNIDO expects to convene in 1982 a consultation meeting on the development of human researces. In preparation for this meeting, surveys have been initiated in industrialized countries aimed at identifying existing training facilities and suggesting ways and means of increasing the training opportunities for nationals from developing countries. Similar surveys are being conducted in developing countries to assess training facilities for their own nationals as well as for nationals from other developing countries. I feel that the organization of this conference should take an active part in the consultations which are scheduled to take part in the U.S. sometime in 1982.

The development of human resources in the developing countries calls for action on an international scale, and for the involvement of people representing different sectors of productive activity. It is important to secure the support of governments and funding agencies to finance survey missions to ascertain whether benefits can be derived by individual countries through cooperative education programs.

At the national level, studies should be made of the costs involved for the introduction of such programs. The interest of industries in embarking on cooperative education programs should also be ascertained. A wide dissemination of information should be made through publications of activities in this field. Policy makers from developing countries should be invited to take part in working group meetings as well as seminars and conferences on cooperative education programs to encourage the development of such programs. UNIDO stands ready to support any initiative in this field that could help the developing countries in their industrialization efforts in general and in the development of their human resources in particular.

SESSION 25: IMPACT OF EDUCATION/TRAINING ON THE TRANSFER OF TECHNOLOGY

Roger A. Holmes
General Motors Institute
United States

In discussing the impact of education and training on technology transfer, I find it useful to focus on several kinds of technology transfer and purposes for technology transfer. At the outset, I define technology transfer as the process whereby people knowledgeable in a particular branch of technology expand the effective use of that technology to other people.

The popular concept of technology transfer in this country stems, in my view, from the pressures upon NASA and other federal agencies, but primarily NASA, to demonstrate value to the taxpayer of intensive high technology developments such as the Apollo program. Thus there is in this country an implication in the phrase "technology transfer" that it is advanced, or "high" technology, that we are talking about. That is certainly a part of technology transfer, but in my view "high" technology is the easiest kind of technology to transfer through education and training.

Three ways in which this portion of technology transfer is done demonstrates the ease of transfer. First, good engineering schools work the new high technology into their coursework. As an example, most schools of electrical engineering in the United States were incorporating microprocessors into the junior year work by 1974 or 1975. Virtually all B.Sc. graduates in electrical engineering since then have been steeped in microprocessor knowledge and are the primary developers of the technology today.

Second, to continue with the microprocessor example, there is an enormous number of courses ranging from part of a day to weeks and given by schools, companies and independent consultants. A six-year-old corporation I know of now grosses $10 million/year performing its sole function of teaching working engineers and managers about microprocessors. A common joke in electrical engineering circles a few years ago was that on any given day 25% of all EE's in the country were sitting in a microprocessor course. My own estimate is that it is possible to find at least one short course in microprocessors somewhere in this country on any working day of the year.

Third, corporations run their own in-house courses in high technology related to present or potential interests in their businesses. My corporation, for example, now uses at least one microprocessor in every car produced. You can understand, I am sure, that we concentrated intensely on in-house technology transfer to practicing engineers when the microprocessor technology appeared to be essential to fuel economy and emission standards.

There is also a large business in the technology transfer of older, well-established technologies to the person who needs the knowledge for the first time even if it is well-known by others. It is common knowledge among people involved in continuing education for adult learners that a two-day course in advanced quantum optics will sell to a very limited audience if at all, while short courses in fundamentals of welding, elements of value engineering, basic hydraulics, and electronics for electricians will pack the classroom to standing room only. It has been our experience at GMI, for example, that in a corporation of our size there is always a market in basic hydraulics, say for the neophyte who did not happen to catch that subject in school or for the seasoned engineer (or technical support staff member) whose responsibilities have expanded to encompass areas outside of his experience base.

This sort of technology transfer is, in my opinion, as demanding as high technology transfer or more so, and with good reason. In high technology oftentimes applications are not yet well-established, but a good showman-teacher can receive a high student acceptance of material upon careful explanation of concepts and demonstration of a few exciting examples of hopeful applications. In Fundamentals of Welding, however, the student knows that welding has been done in many ways, for a very long time, on an impressive variety of materials; he demands a teacher who knows the basic concepts, *and* knows the advanced concepts, *and* knows the tricks, *and* can spin yarns about applications, *and* even looks like a person whose hands, arms and eyes have done a lot of welding. In short, the more well-established the technology, the more the transfer agent must be an accomplished practitioner.

A third area requiring education and training for technology transfer occurs when a technologically accomplished member of an enterprise walks out the door, changes his job, transfers, retires or dies. Or it may be that through change of emphasis or political forces or economic stringencies a strong technology team that took time and effort to build breaks up, and the team's capability is lost. I think this happens far more often in enterprises of every kind than we like to believe. Education and training is only one phase of technology transfer necessary to rebuild the lost skill. For example, I am reminded of a concerted effort on the part of a large federal agency to prevent ultra-miniature mechanical components machining skills from vanishing from the U.S.A. altogether. We can say that this sort of technology transfer is essential to technology survival. I face this problem when skilled, experienced faculty retire without having fully passed their insights to those remaining.

Finally, technological cutting edges in my field (electronics) and many other fields are much more likely to be found in industry than in the technical schools. We academics do not like to admit that, but I think it is true. One of the finest ways to transfer technology to people is through the cooperative education concept, mixing classroom theory with industrial practice to the benefit of both. At GMI we have got one of the best windows on technology a school could possibly have in the General Motors Corporation, and we are transferring that technology to our students at a fine rate in the cooperative program, compounding the transfer with classroom formalisms and thereby providing fine young people for our enterprise. Study us, if you will. We are a unique star in the constellation of cooperative education schools: we are a part of General Motors Corporation and, as a wholly-owned subsidiary, our students work only in the General Motors Corporation.

Daniel Hauet
Special Representative to the Director General of UNESCO to UNDP
France

I fully concur with the definition of the transfer of technology given by my colleague. I was also interested in the three specific cases to which he drew our attention, and their relation to the educational process, where the incorporation of productive work experience is to play a greater and greater role. These three cases (high technology, well-established technology, and losing technology) are very important in an industrialized country.

I will now, as UNESCO Representative, introduce to you the linkage between the transfer of technology and the educational process in other parts of the world, mainly in developing countries. UNESCO is an international organization which deals with education, science and technology, culture, communications and information. The new UNESCO program for the development of scientific and technological research and training for 1981-83 amounts to $90 million; one-third is earmarked against UNESCO's own resources, the remaining two-thirds are financed by extra budgetary sources like UNDP or some donor countries under funds-in-trust agreements.

UNESCO's activities for the transfer of technology will emphasize the training of highly skilled manpower by strengthening higher education in science and technology and increasing its efficiency and relevance. Special attention will be given to establishing cooperative links between teaching and research institutions and the various sectors of application so as to involve specialists and research workers more fully in development operations. The scientific and technological infrastructures of member states will be reinforced with a view to optimum utilization and more active participation in the effective transfer and development of technology. Activities directed towards training, increased efficiency and strengthening of teaching and research institutions will help to develop the endogenous scientific and technological capabilities of member states and the working out of appropriate technologies adapted to their social and economic needs.

Continued cooperation with international non-governmental organizations concerned with science and technology will be marked by an increase in their activities in developing member states and a greater participation of scientists, research workers and engineers from those countries, with a view to strengthening international intellectual cooperation and improving the dissemination of its results. The establishment or strengthening of regional scientific and technological cooperative networks will make it possible to move forward towards the solution of problems common to several member states, and at the same time provide a link with international joint research programs.

Another important part of this program is the determination of research priorities linked with human needs and the goals of society. The expected results are: reorientation of research priorities and activities to bring them into line with social goals and human needs; determination of new priorities in interdisciplinary research; establishment of information systems to improve the transfer of knowledge and to provide member states and the international scientific community with information on interdisciplinary research directed towards the solution of problems connected with society and the satisfaction of human needs.

Another major component of the program is the strengthening of the technological infrastructure in developing countries, in particular technical information services, metrology, instrument maintenance, testing and analysis and calibration, which are essential to all applications of science; encouraging the grouping of basic technical facilities in science complexes; assistance for the establishment and operation of training facilities for engineers and technicians at all levels as well as of schemes for establishing contact between scientists and engineers and keeping them informed.

UNESCO's work in higher scientific education and for the training of engineers and technicians is based on: improving the teaching of basic sciences at the university level by research, curriculum development and exchange of personnel and information; training the staff of engineering schools by means of seminars and post-graduate courses; producing publications, manuals and training materials; training engineers and technicians in a manner more in keeping with economic and social conditions and strengthening national training infrastructures; and providing practical orientation and experimental work in the training of scientists, engineers and technicians. All of these programs are undertaken in close cooperation with non-governmental scientific and technological organizations (ICSU, IFIAS, WFEO, etc.) at the global or regional level.

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We cannot isolate the problem of the transfer of technology from the problem of development. The latter is an objective; the former is a tool which should be assessed according to its utility in development. There is no model for national development. Industrialized countries cannot impose their model on developing countries. You cannot separate economic development from the social and human factor. Each society has to find its own path. Three basic principles have to be acknowledged. First, human resources are important in the process of development. Second, developing countries have very few chances to achieve their goals outside a new international economic order, which still has to be implemented, with new trends in trade and exchange. World peace also is needed to accelerate the process. Third, development at the country level should be tackled by the indigenous population according to its cultural identity, therefore based on an indigenous development that the international technical cooperation system has to favor with first priority.

Let us now return to the technological component of development and the problem of the creation, transfer or adaptation of modern technology. We have to be guided by the same policy. First, there is no successful transfer of technology without prior knowledge of all local conditions and a willingness and potential for the local population to adopt and appropriate this technology (bad examples are the undertakings sold "keys in hand"). Second, the utilization of the word "appropriate" technology is not "appropriate"! Many times people claim to get straight the most advanced technology and not a second class one. Third, the local population should be able to participate in the decision-making process before a transfer of technology starts (a large dam or a few small ones may have the same impact in terms of irrigation but not in terms of the local economy). To the greatest extent possible, indigenous capacity should be built before or parallel to any transfer of technology.

What tool will enable people to understand the possible choices, to make, to create, to adapt any technology? It is SCIENCE. Only a scientific understanding guarantees the success of technological transfer and adaptation. Scientific education has to be intensified in developing countries. It is an expensive path but it should be the first target of international cooperation. Its direct corollary is the need to also develop technical education at all levels.

The necessary resources and technological potential exist for eliminating the under-development of the developing countries and for improving the well-being of humanity as a whole. The achievement of this goal presupposes that developing countries exercise full control over their own resources. It also presupposes an equitable distribution and creation of scientific and technological capabilities of the world.

Developing countries have long recognized the need to pursue policies of creating the necessary structures at the national level in order to maximize their capacities to develop, absorb and use science and technology as well as to distribute the results of those important tools of development among all sectors of their population. However, the international community at large must recognize that there are, and will continue to be, limits to the ability of developing countries to realize their full potential as long as there is no restructuring of existing international economic relations on a just and equitable basis.

The United Nations Conference on Science and Technology for Development, held in Vienna in August 1979, proposed what is now called the Vienna Plan of Action. This plan calls for strengthening the scientific and technological capacities of developing countries by the: (a) creation and/or strengthening of the policy-making capacity of developing countries in scientific and technological matters; (b) promotion of the self-reliant efforts of the developing countries to strengthen their scientific and technological capacity; and (c) strengthening of the scientific and technological capacity of developing countries, inter alia through external support and assistance, to generate scientific and technological knowledge in those countries and to enable them to apply science and technology to their own development. It also calls for the restructuring of existing international cooperation so as to promote a better distribution of world production and resources in the fields of science and technology, and strengthening the role of the United Nations in the field of science and technology and the provision of increased financial resources.

While the Vienna Conference did not propose any really new guidelines regarding objectives to be attained in UNESCO's fields of competence, it helped to call the attention of the international community to the factors which govern endogenous scientific development: those which are of external origin and bound up with the structure of international economic exchanges, and those which are of internal origin and connected with the highly complex conditions of the generation and introduction of technological progress in developing societies. Its conclusions placed emphasis upon the complexity of the strategy to be applied in this respect and on two major concerns of developing member states: to remove as soon as possible the restriction on freedom of decision arising from technological dependence, and to effect transfers of technology.

In light of the Vienna Conference, certain considerations call for increased attention.

(i) With regard to scientific and technological activities, research and development (R D) directed towards precise objectives is essential. It must rest not only upon basic research, but also on a set of services, chief among which is scientific and technical information.

(ii) With regard to scientific and technological personnel, all available national skills at all levels and in all sectors--public and private, educational, industrial and agricultural--need to be built up and mobilized. The dynamics of endogenous technological progress calls for an information flow and cooperation between academic scientists, production engineers and technicians, people in positions of economic responsibility specializing in technical problems, and others. Innovation is not the preserve of any particular group.

(iii) The optimum use of the available scientific and technological potential should permit not only the most sophisticated forms of research, which must never be regarded as nobler than others, but also technical improvements with an often considerable economic impact. This potential should be drawn upon for operations involving adjustments of imported technologies to local conditions, which may concern either equipment and raw materials or the methods themselves.

(iv) The "demand for technological progress" on the part of the very people who will have to apply it, particularly the entrepreneurs of the production sectors, is an essential factor in endogenous scientific and technological development. The measures needed to stimulate demand lie well outside the domain of science and technology and are of an economic, fiscal or organizational character, since encouragement of innovation rests on the provision of material advantages to those engaging in it.

(v) The all-important role of scientific and technological education should be extended, strengthened and improved (curricula and content, teaching methods, applications) at all levels of education.

We have returned, once more, to the important role of scientific and technical education in developing countries, and we have already noted its high cost. We must also underline two difficulties inherent in the not-yet-industrialized environment in most developing countries. First, greater social consideration should be given to technical education as a major tool for development. In some cultures craftsmen were relegated to the lowest social rank but nevertheless feared for their "magic" powers. More popularization of science and technology will change this approach. Second, the introduction of practical experience and productive work in technical and vocational education might be difficult when industrial job opportunities are still so scarce. It will require a more careful management and development of innovative approaches to solve this problem.

I hope I have been able to bring to your attention some features of the problems of transfer of technology and its relation to scientific and technological education in developing countries.

SESSION 26:
ACCREDITATION OF COOPERATIVE/SANDWICH PROGRAMS

Edwin Kerr
Council for Academic Awards
United Kingdom

I am going to offer my remarks about the accreditation of cooperative programs in the U.K. from the perspective of the Council for Academic Awards. The CAA has some similarities to the major accreditation bodies in the U.S., but its place in the U.K. cannot be understood unless its own special features are recognized. It is a body which approves programs, approves institutions, and actually makes academic awards to students at the end of a program. Academic institutions cannot offer unvalidated programs. Unless they get accreditation from the CAA, a program cannot start, and if we withdraw accreditation at some stage the program must stop. The scope of the body is such that it covers all disciplines except medicine. Apart from the 45 universities, the only other body authorized to award degrees within the U.K. is the CAA. We carry out our work by a series of regular evaluations on a five year cycle, and we feel that the CNEA is an instrument which assures high academic quality.

The CNEA has been and continues to be a strong supporter of cooperative education programs, and I will briefly describe the essentials of the accreditation procedure for these programs. Proposals for cooperative programs are set within a clear framework, while the details of the proposals are developed by staff members themselves who will teach the program. We expect them to have thought out and documented in detail the type of program that they want to offer, and to have given us a detailed course submission and a list of facilities and staff, etc. Having received such documentation, my body would then appoint a group of academics and professionals to visit the institution if it is being validated for the first time. If it is being re-validated then we would need the same sort of document describing the program but also describing the program's actual operation over the preceding period, its problems and successes. Assuming we have taken a group to an institution to look at the program, we would want to talk to their staff first of all about the detailed arrangements which they had made with industry to insure that there would be an adequate supply of suitable placements; secondly, about the objectives of each training period and their relation to the rest of the program; and finally we would discuss a proposal for joint supervision, because in the U.K. when a student goes into industry for training there is industrial as well as academic supervision.

There are also some important things that we do not discuss. We do not actually go out into industry and hold discussions with the industrial supervisors who will be dealing with the students. We do not make judgments on the industrial staff and their competence to supervise the students. We expect the college to be able to undertake these matters themselves.

Let me turn now to the problems and questions that people might be asking themselves. In the last six or eight years, discussions and literature on this subject in the U.K. have focused on whether we can find enough places in industry to accommodate the students. This is not as much of a problem in the States, but in the U.K. the mis-match between supply and demand of work positions is now a major problem. One reason for this is the growth of the scale of sandwich courses. Over the last seven years there has been a growth of some 63% in the number of students who are involved in sandwich courses and are therefore looking for industrial placement. But the major problem is that we are in the midst of an industrial recession in the U.K. and although industry may be sympathetic to the cooperative programs, it finds it very difficult to offer placements to students when at the same time industry is having to effect cutbacks in its own staff.

These two problems have led to a number of difficulties. There is a diminishing return from the ever-increasing efforts that are being made by colleges to find training placements, more time and effort being needed to obtain these places. The need is so great to find places that in many cases institutions are accepting quantitatively weak positions that don't actually match the requirements of their scheme and which give students employment unrelated to their programs, and this is a problem to which my organization must devote more effort. The financial recession has also caused problems for the quality of academic and industrial supervision, and this tends to reduce the credibility of these programs. This calls into question whether it is adequate for accrediting bodies to leave it to the academic institutions to find industrial placements, assuming that they will be able to control the quality.

A number of questions therefore arise. Are the benefits which students derive from sandwich courses commensurate with the efforts required to organize these courses? Can we be certain that these courses do give the high quality education to students that we claim they do?

A major work that was done at Bradford University in the late 60's and early 70's says that sandwich courses are a disappointment, that they do not in many cases achieve the integration between the academic part of the course and the industrial part of the course. The report does end with the qualification that it would be wrong to attach too much importance to one group of empirical studies.

On the other hand, a recent report carried out in Britain in the engineering field noted that "Formal engineering teaching should be closely orientated to practice and applications. In an ideal world all engineering students would obtain their experience through some form of sandwich course. Employers have expressed themselves as keen to recruit sandwich graduates." So after a detailed investigation, this particular enquiry came out strongly in favor of the sandwich principle.

Because program assessment has recently been dominated by quantitative issues, I feel that we must do some additional qualitative work. In the program we are now planning, we will be evaluating the quality of the learning which students derive. We will be looking at the quality of the supervision carried out by academic and industrial supervisors and at the methods used to assess student reports on their placement. Above all, we will be trying to answer the question: Has the student been educated both in the theory of his profession and in the practice of that profession?

Richard J. Rowe
Director, Division of Eligibility and Agency Evaluation
U.S. Department of Education
United States

I have been asked to address the following three issues concerning the development of programs which bring productive work experiences into the curriculum: Firstly, what are the current policies regarding accreditation of curricula incorporating productive work experience? Secondly, what are the major problems regarding the evaluation, certification, or accreditation of programs? and thirdly, what are the important questions that educators and others need to address for the successful implementation of such programs?

Before any response to these questions is attempted, it must be remembered that an important distinction of education in the United States is that the development and maintenance of educational standards are the responsibilities of non-governmental, voluntary accrediting associations. The U.S. Department of Education recognizes the significant contribution made by the voluntary accrediting associations to the excellence of educational service in this country, and it remains the policy of the U.S. Department of Education to support and encourage recognized voluntary accrediting associations in their work as principal agents for the assessment and maintenance of educational standards in the U.S.

There are currently 75 private, non-governmental accrediting associations which have met specific recognition criteria established by the Secretary of Education. In addition, the function of accreditation as performed in the U.S. reveals that accrediting agencies do not control educational institutions or their programs, but they do establish standards and sanction those institutions or institutional programs that satisfy those standards. Usually, institutions and programs voluntarily apply for accreditation.

The two major types of accreditation are regional and specialized. Regional accreditation considers an entire institution; specialized accreditation looks at specific departments, specialties or programs within an institution. Accreditation is granted for a limited period of time and is considered to be an indicator of quality.[1]

A partial response to the first two issues is suggested in the material previously presented concerning the accreditation process as practiced in the U.S. and the relation of the Federal government to this voluntary activity. Dr. Asa S. Knowles, one of the nation's acknowledged experts on cooperative education, presents further insight on the issues in the following statement about the influence of cooperative education on curricula: "In spite of the negative attitude on the part of some faculty toward the cooperative system, studies show that most faculties (particularly those in professional curricula such as engineering, business administration, pharmacy, and nursing, where the validity of the cooperative concept in career preparation is most evident) appreciate the values of cooperative education and support it."[2]

In regard to the accreditation of cooperative education programs, Dr. Knowles reports:

> Agencies that accredit colleges and universities (those that accredit professional programs within an institution, and those that accredit the institution as a whole) have not been consistent in their policies with respect to recognition of academic credit for off-campus experiences. Several of the agencies accrediting professional programs of study are willing to recognize the satisfactory completion of an off-campus cooperative experience as a requirement toward the degree.
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> They have always stipulated, however, that the experience be of the "add-on" variety and not part of (or taking the place of) the traditional credits earned in an on-campus academic program. Accrediting agencies concerned with the institution as a whole (Higher Education Commission of the Regional Associations of Colleges and Schools) have been willing to accept academic credit for off-campus experience as equal in value to those earned in the classroom.[3]

Cooperative education has emerged in the 80's as a significant educational medium, strongly supported by those who best understand its values: participating institutions, employers, cooperative education students, their parents and the communities that cooperative education serves. It may therefore be appropriate on this occasion to examine the desirability of implementing a process that would provide for the certification of cooperative education work programs for those institutions that believe such an evaluation would be helpful.

Initially, a needs assessment plan developed with the support of the leadership of the total cooperative education enterprise should be conducted. A number of steps would be involved in this assessment. Let me suggest the three that might best commence the process.

1. The promulgation and agreement to a definition of the substance to be included in a productive work experience for a cooperative education student is an initial requirement. It should further provide for a description of a measurable unit of time to be spent in a work assignment. The unit of time should be expressed in quarters or semesters and should describe the number of hours, weeks and months dedicated to the work period.

2. Consideration must be given to the subject of supervision. Responsible supervision should be assured for both the direct supervision of the student-worker and the provision for oversight of the work site environment by an institutional coordinator in order for a determination of the educational value of the work experience to be determined. Competent coordination requires the assignment of qualified staff to administer the program.

3. Finally, it is important to provide an evaluation system that would be capable of examining the level of achievement reached in meeting the educational objectives established for the student-worker in each position within an institution's program. Established performance requirements must be satisfied if certification based on standards is to be meaningful.

One may conclude at this point that a certification process is not an easy task to undertake. Indeed, there are negatives that must be considered. Not the least of these are the increased cost of operation, the promulgation of rules or regulations and a general collection of troublesome issues that will surface as the process evolves. Records must be permanently maintained and a registry would be required for the verification of the satisfactory completion of the activity.

It will require hard work, perseverance and a true professional belief that certification is needed and will enhance the development and acceptance of cooperative education. It is a subject worth our attention.

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[1] D.A. Trivett, "Accreditation and Institutional Eligibility," ERIC/Higher Education Research Report 9 (1976).

[2] Asa S. Knowles, Handbook of Cooperative Education (Jossey-Bass, Inc., 1972), p. 229.

[3] Ibid., p. 234.

Nancy Archer
Peat, Marwick, Mitchell & Co.
United States

I am an employer of cooperative education students, so perhaps my remarks will be colored by my positive experiences with them. I am also a member of the Commission on Higher Education, which is a 24-person board responsible for taking a look at the issues and problems related to the accreditation of specific institutions. Most of the members of that board are affiliated with specific institutions, and I am one of three public members who provide perhaps a non-traditional, non-academic perspective.

I will begin with a few theoretical remarks. The definition of cooperative education is certainly not a uniform one, although voluntary accreditation is much more comfortable in dealing within a traditional framework. In 1978 the Council on Post-Secondary Education defined cooperative education as ". . . an attitude rather than a system, an attitude which puts the student first and the institution second. It can stimulate exciting and high educational process, quality progress, but unless great care is taken to prevent the freedom it offers, it could be the unwitting means to a lessening of academic rigor and even to charlatanism." Moreover, COPE summarized that the emphasis of non-traditional education is on outcomes, whereas in traditional education the emphasis is on structure and process. Bringing these two points of emphasis closer together, Jim Wilson wrote in New Directions for Experiential Learning that any educational process has three integrated parts: objectives, learning experiences and evaluation, and cooperative education is no exception. Therefore, by bringing objectives, process and outcomes together he brings cooperative education into the definition of what the entire educational framework is or I would submit to you what it should be.

Peter Drucker, a management consultant, recently wrote an editorial in The Wall Street Journal cautioning us not to underestimate the public's increasing demand for accountability in the provision of education. A student wants to know what he or she is going to be getting, parents want to know what they are going to get in return for their substantial investment, and the federal government wants to know where and how those dollars are being spent. Drucker asks: Is education too passive? Can traditional education change?

Cooperative education is something that has addressed the educational needs of our society and is the beginning of needed and constructive change. It is now part of our accreditation studies to demand from educators using the traditional classroom approach that they take a look at what the student is getting out of it. We should all take a harder look at outcomes, and I think that COPE was a major influence in taking a different perspective on non-traditional education.

Should there be a different process, a whole different set of rules and ways of looking at cooperative education? No, absolutely not. It should be uniform, the accreditation criteria for all institutions being such as to establish a clear relationship of institutional purposes to educational achievements.

What are the current policies regarding accreditation of curricula incorporating the productive work experience? There is no difference in the process whether you are looking at a traditional educational approach or at cooperative education. The quality is measured by the astuteness with which an institution identifies the objectives, and basically the only thing that voluntary accreditation is asking for is the institution's integrity and its commitment to its programs. Those are the keys to excellence in any educational program and the keys with which they will be judged.

What are the major problems with regard to accreditation of cooperative education programs? Morris Keaton wrote an article recently in which he said that the responsibility rests with the institution to first define the objectives of its cooperative education program. The first problem is that some cooperative education programs have not assessed their objectives. Keaton wrote too that you then have to take a look at how you are going to evaluate your program against those objectives both in the formative stages and also after the fact. It is hard to do an evaluation visit in a limited period of time, and very hard to find out what is going on if nothing has been done in terms of documentation.

Another problem for cooperative education is the traditional educators' perception of the work experience as being unrelated to general education. I think that part of that is a tremendous fear on the part of the liberal arts faculty that they are losing ground to the more practical disciplines such as business administration, engineering and the combination of experiences in cooperative education.

A major problem that we have in the accreditation process is the lack of qualified team evaluators to look at cooperative education programs. We in the Middle States Association run workshops on an annual basis to train people to be able to evaluate correctly, and we select people carefully for evaluation visits, but there are still difficulties in this area which I am sure others have experienced. A director of a cooperative education program recently told me that the last time an accreditation team came to his campus no one really took a serious look at the program, which can happen in voluntary accreditation because it is a consultative rather than prescriptive process.

From industry's perspective, I myself was very skeptical as an initial participant in cooperative education. I thought it was going to be an imposition on the work that we had to get done, but that was not the case at all. It was an extraordinary benefit. There is a much greater need for cooperation between education and industry in general. This leads to another question: If cooperative education believes in itself and its values, why not give school credits for it? A lot of cooperative education programs do not award credit. I understand the problems of transferring credit and so on, but we must change the perception of the value of cooperative education vis-a-vis traditional education.

Finally, I will say that I think that things are moving forward. Voluntary accreditation agencies have become much more perceptive and aware, and we want very much to work with the cooperative educators because we see the value in the greater communication and awareness that takes place in cooperation.

SESSION 27: A BUSINESS AND INDUSTRIAL RESPONSE TO THE DEVELOPMENT AND USE OF HUMAN RESOURCES

Björn Grünewald
Deputy Director, Swedish Employers' Confederation
Sweden

At this conference I am representing the BIAC (Business and Industry Advisory Committee), since I am a member of its Committee on Education.

My lecture has three ingredients: observations on learning, on the role of schools and on the needs of industry; reflections and examples from the OECD countries; views of the BIAC on cooperative education and the strategic role that cooperation between school and industry must play if the necessary development of human resources needed for the 80's and 90's is ever to be achieved.

In my opinion, the schools of most modern societies are placed in an impossible situation. They are supposed to achieve the healthy development of the young not only without active support from the adult world but often having to work against what goes on in society, to compensate the young for all that we adults do wrong or do not care to do. In this situation, the training of teachers and the organization of schools are inadequate to cope with the task at hand, are sometimes misdirected and certainly not given enough resources and respect by societies that are, in effect, abandoning children, and in so doing endangering our future.

The BIAC Member Organizations and their members are charged with the task of helping to provide the material and economic foundations for the well-being and development of their respective societies. Both in the narrower context of the direct interests of the BIAC membership and in the wider societal context, education and training are critical factors. Most industrial enterprises in our modern societies are to a very large degree dependent on having access to sufficiently competent personnel, and that is what education and training is all about--to develop, maintain, and if possible, further enhance competence in people.

Competence can be described as the active ability of a person to apply and make use of the knowledge and skills necessary to fulfill an actual task or objective. Business and industry consider it to be the task of the school to develop each individual according to his or her abilities and preferences and to prepare them for the demands, challenges and the infinite possibilities of the adult world. To ensure this the school must develop competence in three dimensions: personal competence, which enables the individual to develop and exercise skills and knowledge basic to all necessary private and civic functions and to express himself fully according to his interests and abilities; social competence, which enables the individual to co-exist and cooperate with other individuals, practically and democratically, in groups and societies of all sizes and durations; professional competence, which enables the individual to take part in the work of society in various ways and to develop the skills and abilities necessary for a professional effort.

Since we represent the world of work our main attention is, of course, focused on the third of these dimensions of competence. At the same time we realize that all three dimensions are necessary to each other and that they must all be respected and promoted.

Knowledge is the foundation, but in itself only a tool, a dead thing, as long as its possessor is not able to wield it to some purpose. The key to survival in a dynamic society lies in active knowledge, active skills and active motivation on the part of all individuals, in short, in putting their competence to work.

In all the OECD countries over the last century, increasing demands have been made for more effective transfer of knowledge to the young. What complicates matters for educationalists is, however, the complex and many times adverse influences that the increasingly complex organization and behavior of modern society enacts on their pupils. Perhaps the very act of organizing a special and separate system to promote learning isolates it from the society for which it operates.

Isolation creates two kinds of disturbances in the learning processes. The first type has to do with the complexity of the respective systems, society at large and its learning system. The other has to do with the fact that society at large and its adults influence the pupils of the learning system in ways that in themselves generate learning. Unless the two systems are perfectly coordinated, this causes frustration and conflict. For example, in most OECD countries school children are exposed to television for longer periods than they are together with teachers. Obviously a learning or school system in a society can never control the rest of that society. It has to co-exist with it and to some extent balance its effects on the pupils.

The dominating factor in the functioning of a school system of the classical isolated type is that most adults present are adults trained to be together with children who meet few other adults other than those trained to be with them. These particular adults are not part of the rest of society's adult world of work. They grow up, train and work in the self-containing school system. Therefore their actual behavior varies both from that of other working adults and from the theoretical goals their education is trying to achieve in the pupils. This is one of the main causes of the disciplinarian problems in the schools of most developed countries. The way teachers work partly contradicts what they try to achieve through teaching.

It is important to point out that the great value attributed to work in our culture is neither self-evident nor necessary. It is a fundamental issue for the survival of our type of society and our culture that the various institutions of the community continue to give active support to a positive attitude towards work. The system of economic and social rewards must continually support the belief that a good job is valuable for the community and therefore also for the individual, economically as well as socially and culturally.

It is also important to underline that all successful activities require persistent efforts and disciplined work. This truism applies to the private individual who is seeking enjoyment or happiness or the achievement of personal goals just as much as to activities for the benefit of society and for productive work. It should therefore be an urgent concern of our schools to instill the idea of work both as a method of achieving results in various fields and as the principal method in the activities of the school itself.

Because of this isolation phenomenon many of the vital concepts and structures of society tend to lose their meaning for youngsters. The decisive factor in this is the parallel institutionalization of education on the one hand and working life on the other. In our complex societies we need educational systems to promote the basic development of competence in our young. That is a necessity for the survival and development of our societies.

Extensive schooling for the majority of each generation encounters three major difficulties. The first is that no two human beings are equal with regard to their ability, interests and personalities. The school system must grant everybody equal rights to develop their unique personality, but this is something quite distinctive from giving everybody the same education. Unfortunately, it is much easier to organize and carry out a policy of educating everybody alike than to operate on the principal of equal respect for each individual.

The second difficulty that a comprehensive educational system has to face is that the necessary length of the educational process makes it hard to keep up with what is going on in the "outside world."

The third problem comes from the length of the educational process combined with the inherent tendency of school systems to become isolated from the rest of society. To many pupils, the education then becomes abstract and appears neither meaningful nor even comprehensible.

The OECD countries are not very homogeneous, although education is, perhaps, the largest monolithic structure in our countries. There are always exceptions to the trends that might dominate in each country, as well as in the whole group of countries. In Japan for instance, by a unique consensus each separate part of the Japanese society functions as an integral part of the whole. Thus the school children prepare for working life by absorbing knowledge of a broad general nature, and they have an attitude that enables them to make themselves useful while training for the actual jobs they get employed to do. Austria retains in common with other German speaking countries a dual system of school and apprenticeship-type training, and Austria has fewer youth problems than any other of the OECD countries today. The U.S. and Canada have developed the practice that we are here to study, that of cooperative education. What is common to these countries is that they have successfully achieved the desired end result in very different ways.

Neither of the two traditional categories of educational behavior, education in industry or education in school, represents the solution to the present-day dilemmas. However, they might be considered as the classical pair of thesis and antithesis. This concept at the same time points to the obvious solution, the synthesis that combines the untenable extremes into something new. Thus the solution to the educational methods quandary might well be a synthesis of education in society and education by a separate school system, in other words, cooperation between schools and working life. This is nothing new in itself, and has in fact been advocated for many years by representatives of the Business and Industry Advisory Committee.

What attracts the BIAC organizations is the concept itself, which can be explained both as cooperation in the literal sense of the word and as co-existence between two systems. A synthesis between education in isolated school systems and education in the world of work is necessary if our countries are to survive at all, and cooperative education enables young people to understand the educational processes better. It enables a combination of productive work and efficient education. Demands for changes and developments of the school systems and of their modes of operations will ensue when they are brought in contact with the ways and realities of the outside world. Counselling and vocational guidance will be made easier and the choices of the students more realistic.

The concept of cooperation must permeate all levels of education, both primary, secondary and post-secondary. It is important that the nature of the school as a workplace be observed, and that suitable working practices and methods be used in the work of the school. This is perhaps more of a preparation for cooperation which must be present from the very start of the school system.

Another aspect of cooperation may also well start already during primary school, namely visits by school children to various places of work. Such study visits, and practical work experience for older pupils, must never become isolated outings that are not connected with teaching in school. Instead they must be made part and parcel of the educational process. This type of cooperation is mostly aimed at producing the necessary synthesis, at closing the hitherto widening gap between the world of work and the world of education.

Vast systems for the promotion of cooperation between schools and the world of work are coming into being in many of the OECD countries. Examples can be given from Sweden and the other Nordic countries, Germany and Italy where industrialists form special groups or councils for the cooperation with schools and the providing of contacts in various forms between their companies and the school pupils.

Already during secondary education, the cooperation between school and industry could well incorporate more active schemes like the cooperative education of North America. There are examples in other OECD countries of such practices. Perhaps the German speaking group of countries with their "Dual System" can be considered the pioneers. In these countries as many as half of each age group partake in schemes where they work two, three or four days a week and go to school for the remaining period. They are under contract with an employer and receive wages for their periods of work. France also has introduced a direct cooperation plan for their technical colleges, but in this case without paying the pupils wages for the periods they practice.

The resource motive for our positive attitude to cooperative education is very important in most of our countries for the rest of the 80's. In October of this year the OECD is arranging a high level conference on higher education which will focus on several interesting themes. Among them is the matter of access to higher education in a period when most governments' ability to fund even the existing volume of education is directly threatened.

The resource aspect of cooperative education practices also focuses on the moral and philosophical dilemma of societies in which education has expanded faster than the number of positions requiring education. In a static analysis we are already educating too many people. In the dynamic analysis, however, the question is rather how to stimulate well educated students to make use of their competence. This is exactly where Japan has been so successful. Instead of demanding jobs corresponding to their training, students accept that they must start humbly at the bottom, taking the least interesting and rewarding jobs and working their way upwards, all the while making use of all their faculties and training.

The Business and Advisory Committee to the OECD puts great emphasis on the linking of education, training and work through cooperation between school and working life. We consider this cooperative effort as being the strategic synthesis for the 80's and 90's for our countries which are faced by youth unemployment, shortages of funds for education and schooling and various other ailments. With the concept of cooperation, we include the whole spectrum from the attitudes towards work that must be instilled already in young children when they begin school, the way teachers work and educate, through cooperation between schools and working life during primary and secondary education, to the actual cooperative work-education schemes that are successfully carried out on the post-secondary level in the North American countries and in some European countries, where traditional methods and experiments on the secondary level also inspire us.

Finally, let me point out one aspect of cooperative education practices that has not been mentioned here before. This is the contribution it can make towards realization of the long cherished theme in the OECD of recurrent education.

The economy will not permit sabbaticals or paid educational leave for recurrent education. Perhaps cooperative education schemes can be put into practice which will make recurrent education viable again.

Thus, cooperative education must become the strategy for the future which, even if it never becomes a cure, a remedy for all ailments of our society, still might inspire us to find new ways of solving many of the troubles and dilemmas that have plagued us during recent years. This required creative actions from all the parties involved, among them education authorities, schools and universities, teachers, students, parents, and not least the world of work to which this poses a real challenge. Let me state on my part that I am confident that business and industry will meet this challenge, realizing its potential, and I invite labor to join us in these efforts.

Sandra Kuntz
International Paper Company Foundation
United States

I am vice president of the International Paper Company Foundation in charge of their educational programs. I will begin by telling you what we do in the area of education.

First of all, the Foundation has had a program of aid to public schools in its community since 1956. It is now designed to help approximately 25 small rural schools in the eastern U.S. A new career education concept in this program is called the Education and Community Resources Program, in which some IP managers go into the elementary schools, for example, and talk about what it is like to be an accountant or an engineer, or they go into high schools and talk about highly technical skills, the need for computer specialists, and so forth. Many of these programs concentrate on improving reading and communication skills, as well as math and science skills, and we are trying to increase the number of minorities and women who go into the non-traditional fields. That is our major educational effort, and because of that effort we do not have a program of aid to higher education. We are very proud of what we have done through 25 years of support and $10 million in these programs.

I will divide my main remarks into two sections, beginning with a description of what I think employers want from employees, especially those employers in the manufacturing business.

At the top level, the managers who are going to make the policy decisions must have those engineering and MBA degrees; very few people will make it up the ladder without those technical kinds of degrees. A doctor of chemistry is now running our company. He is not a paper maker but a chemical engineer and a fine manager. Our middle level managers also have to have scientific and appropriate degrees in order to run the middle level, the staff level operations and some of the support operations within the line. Obviously, we have people for accounting, sales, marketing and communications, who may come in with liberal arts degrees and be trained within the company. We also have secretarial and factory workers who are the hourly wage people.

On the other hand, when we employers talk about what we would like we should include what we need to run our company humanistically. For the best atmosphere for productivity and so forth, we feel it is necessary for our top level engineering managers to have human skills, interpersonal skills, communication tools, and be good managers and developers of people. Sometimes we send these high level managers to Aspen Institute for a two-week program where they can get involved in the classical kinds of educational philosophizing and thinking and become more humanistic in their outlooks. This leads me to think of the reform that Mr. Willis called for and which I think should occur to humanize people in education as well as managers in the corporations so that we do not have an isolating situation in which businessmen do not seem to understand nor care about human values. I think that this might advance the evaluation of what MBA programs contain, and the quality of education and credentialing that our managers should have.

However, being inside a company and knowing how specific the business orientation is, I am not sure that the in-house training programs can be abolished in favor of putting the two parallel systems closer together. There are some very technical things specific to each corporate institution which cannot be changed. When someone comes into our company and does not know anything about our technology we have to put him through a special training program.

By now we all recognize that cooperative education has tremendous advantages both for industry and for students. We do know its limitations as well, for while cooperative education can improve the employability of people and their mobility and motivation, it does not create jobs. There is a strong need to look at the reality of the economic situation in which we are now operating. The present period of conservative financing is going to be an enormous burden on corporations, which are being called upon to compensate for cuts in the federal budget which may total $40 billion. The amount of increase in contributions to the arts in a very short period of time indicates a striking change in trend. Corporations are being called upon to help communities much more, which is why our program has been designed as it has been. I am very eager to have a good case made for seeing more cooperative education programs and to have a strong case made for examining the values of the corporations, but as we embrace a movement of financial conservatism I am concerned that corporations are being asked to do too much compensating for federal cutbacks.

Who should initiate cooperative education? How will labor react and what role should it play? Who should pay the costs of cooperative education programs? Responding from an industry point of view, even though I was a teacher and I work in education, I feel that the initiative must come from the education field, and hopefully the colleagues of industry will listen with a receptive ear. The initiator for cooperative education programs, then, should be the education community since it is an educational concept, and labor and government must be included. I believe too that tax incentives are a very important motivation for business.

Finally, the costs of cooperative education programs should be shared by corporations, which should pay the students for their work; by the government, which should provide tax incentives; and by universities, which should bear the expense of having a staff and faculty involved in planning the programs.

EXECUTIVE SYMPOSIUM

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PRESIDENT RYDER: Welcome on behalf of Northeastern University to an informal exchange of views among people representing industry, labor, government and education. These leaders are concerned with solving some of the world's human resource problems.

We are in a world of change, a world that has changed immeasurably in the past two centuries and is accelerating its change almost yearly. The change has not come to all parts of the world at the same time. The industrialization which came to the British Isles in the early 19th century has still not reached some parts of the undeveloped world. The technological revolution which is all around us, the computer revolution, the communications revolution and the accelerating need for skill technology all affect different parts of the world at different stages, but it is clearly the wave of the future. Urbanism, the growth of urban centers, has become both a common problem and a common opportunity for people in many countries. The drift toward urban living is part of that change in people's life-styles which must be dealt with as we consider the world's problems.

Along with the technological and economic changes that our world has faced in recent decades, we have seen the rising tides of people's aspiration. Symbolically initiated by the American Revolution, the French Revolution, and other revolutions in Europe and the significant political changes in our own recent century, the rising tide of democratic institutions and the model of people participating in their own affairs has become a significant force which has to be recognized even in totalitarian states where the labels of democracy, at least, must be used.

Not only has there been that political change, but now everywhere a rising tide of expectations in terms of the improved standard of living and the opportunity for success has left few countries untouched. It is in the context of this kind of world, a world that is currently also plagued with economic recession, underemployment and unemployment in both advanced and developing countries, that we consider this issue of an educational system which can respond with both relevance and effectiveness and help the world continue to improve and address the realities of the changing times in which we live.

As Shirley Williams said this morning, traditional classical forms of education tend not to change because when you are doing a very good job very well there is a sense of satisfaction that does not lead to modification or improvement. At Northeastern, as in so many of the cooperative institutions represented here, there has been a vision for many decades. The classical models of education do not meet the needs of our present society. Superb for the purpose of training an elite and a small number of people in any one country, the classical system does not adjust itself well to a society in which all people aspire to equality of opportunity for education and where, in fact, perhaps 50% of the population may need to be trained in higher education to meet the technological needs of that society. It is our belief that blending work with formal education allows an opportunity for social mobility and for economic improvement. It is this blending which makes cooperative education a model particularly well-suited to further adoption in the world scene.

The American experience in cooperative education is not the only one by any means. The sandwich plan in England goes back at least as far in terms of its evolution and development. But in America the cooperative model has been developed with great diversity, perhaps more so than in any other part of the world. It is a system which includes very large numbers of students. An appropriate alignment and cooperation is essential between educational institutions and industry. Collectively and cooperatively we may be able to effect change that neither component could accomplish on its own.

COLEMAN MOCKLER: In 1967 Gillette began its involvement in the cooperative program with two positions in the financial area, allowing four students to participate in the safety razor division in South Boston. By the mid-'70s we had about 12 positions serving 24 students in rotation. Currently we have about half that number of financial cooperative education students, and extra students are asked to come at the year-end to assist in the closing of our financial statements. These cooperative education students come to Gillette from Northeastern and Merrimack College, filling positions in financial reporting, cost accounting, raw material accounting, financial planning, consolidation accounting and general ledger accounting. The program expanded at Gillette in 1974 when our advanced technology laboratory first hired mechanical engineering cooperative education students from Northeastern. Since then approximately 10 students have worked in the laboratory, including one from Georgia Tech.

Gillette's personal care division has for the past four years employed in its research and development laboratory cooperative education students who are chemistry majors. These students have come from South Carolina State, Morgan State and Norfolk State. Although the concept of alternating semesters between work and study is not yet prevalent on the West coast, we have worked out an interim plan in our Santa Monica production facility whereby students work roughly 20 hours/week and full-time during the summer. To date we have worked with UCLA employing students in accounting, data processing and engineering. It is interesting to note that all the students who have graduated since that program began in 1978 were hired by the company upon graduation.

Cooperative education took on an international flavor at Gillette in 1979. This was appropriate since nearly three-quarters of our employees work in facilities outside the United States. Northeastern University approached us with the following concept: Ireland is bringing its relatively underdeveloped economy into the mainstream of contemporary North Atlantic industrial society. American companies with Irish operations may encounter difficulties in recruiting and holding managers who are well-educated in contemporary business theory and at the same time possess the attitude and the practical backgrounds that have been the basis for successful enterprise. Northeastern suggested that its cooperative education program, when linked with Gillette, could overcome these difficulties for our company. When we approached Brown AG, a German-based subsidiary of Gillette, which has a facility in Ireland, the management was highly enthusiastic about the idea. An employee of the Brown plant attends Northeastern now, working in our corporate engineering group in South Boston.

In summary, Gillette has at this time approximately 20 cooperative education students working in virtually all disciplines and spread among most of our domestic locations. I have detailed Gillette's involvement in cooperative education in order to indicate the extent to which we have valued this mode of higher education. To us it constitutes one of the primary vehicles for insuring that universities will, on a continuing basis, be encouraged to match academic content with the practical needs of the business world in terms of trained human resources. Far too frequently graduating seniors from regular four-year universities apply for employment at Gillette totally unprepared for a work situation. There is no alternative but to have them acquire either further academic training or work experience before they can compete successfully. Contrast this with an effective cooperative education program at a company where the managers challenge interns with real business tasks, and you have a reservior of talented graduates continuously available year after year. At Gillette we offer full-time employment to roughly one-third of the graduating cooperative education students, and a high percentage of these accept.

The significance of the program and the overall college recruiting effort at Gillette is shown by the fact that over a long period about 20% of all our new employees are graduating cooperative education students. One of the qualities of an effective relationship between a company and a cooperative education institution is that it will exhibit four characteristics. First, the students will be performing bonafide and challenging tasks which relate to the company's business objectives. Second, the work that the students perform, if carried out successfully, will lead directly to an offer of full-time employment upon graduation. Third, the satisfactory work experience will result in students telling their peers at the university that their company is fully committed to the program, resulting in the company seeing the best cooperative education candidates. Fourth, operating managers in the company look on the cooperative experience with enthusiasm and as an opportunity to improve their training skills.

Looking ahead, a good case can be made for the belief that cooperative education offers one of the best opportunities for matching business needs with trained graduates over the next few decades. We know that technology will continue to race ahead of academic institutions' ability to assimilate and communicate and that there will be a shortage of trained workers, particularly in the lesser developed countries. Against these needs, the cooperative education program offers three advantages: First, advancing technologies being implemented by business and exposed to students in actual work situations will make such students, upon graduation, immediately employable in those areas. Second, well-trained cooperative education graduates offer a much less expensive alternative for companies than the full-time training program for graduates of regular institutions lacking the on-sight work experience. Third, among all of this change, one factor remains constant--the value of the motivational aspect of the cooperative program. The importance of the student working his or her way through school is undiminished today, and we believe the graduate is well-equipped to deal with the realities and demands of modern business life and has the stamina to overcome difficulties that everyone faces in a career.

One condition which may work against cooperative education programs, vis-a-vis traditional education, is the likelihood that the demand for graduates in certain disciplines will outrun the supply, not only in the U.S. but especially in the developing countries. Two of the disciplines which are affected today are engineering and management information systems. Students interested in these areas may be more attracted to the four-year schools in order to enter these lucrative areas on a full-time basis at the earliest possible moment. In the developing countries this demand-supply imbalance is evident from the high rate of turnover among professionals who seek to cash in on the aggressive competition faced by all companies for their services. The so-called "fast track" syndrome is one which is faced by all companies in attracting and, more importantly, retaining quality people.

Nevertheless, it is our judgment that the cooperative education movement will continue to grow in the future. In the past, cooperative education students have been an attractive resource for companies, and our view of the future suggests that the environment in which students will compete upon graduation will be even more conducive to the success of those coming from institutions which have a cooperative mode of education.

ELLIOTT ESTES: Cooperative education, which enables students to do a job and get an education, is very effective. It also aids business and industry in obtaining skilled employees, and brings together employees and employers in a way that addresses their individual needs as well as their mutual needs. In fact, it has been very good for General Motors since 1919, when General Motors' association with cooperative education was begun by the legendary Charles F. Kettering.

Typically, we receive 3,000 to 3,500 applications each year for the 500 to 600 openings that General Motors Institute has. So entering GMI students are typically from the top 5% of all the U.S. high school graduates. At General Motors, however, the involvement in cooperative education extends far beyond GMI itself. In addition to GMI students, General Motors divisions and staffs also typically employ more than 1,000 cooperative education students attending other colleges and universities.

In recent years these students have represented more than 100 different institutions in the U.S. and Canada. Our experience convinces us that alternating work/study curriculum is really invaluable to us for the future. It gives employees a hands-on practical training which supplements and strengthens the classroom learning. New employees in General Motors, who have come to us through cooperative education programs, generally have a broader perspective than regular new employees who may be just as brilliant or even more so, but who come from traditional academic backgrounds.

Let me emphasize here that General Motors defines cooperative education somewhat narrowly as alternating periods of theoretical and practical education. We do not consider summer student employment, although we do participate in that, or a single internship (a semester) to be truly cooperative programs. To us, cooperative means a running together of educational work experiences carefully integrated for maximum practical benefit to the student. It takes a lot of effort to insure that education and jobs really do run together and that the jobs contribute significantly to the total learning experience. It takes cooperation, coordination and communication between the schools and industry.

In General Motors, the first-line responsibility for seeing that cooperative education jobs are meaningful falls to a divisional plan coordinator. In most cases these are employees in the recruiting or training fields. The coordinator's job is a little easier when the GMI students are involved rather than students from outside universities, because we like to say that we control both ends of the system. The schedules of work and study are all the same. At GMI it is 12 weeks in the classroom and then 12 weeks in the plant.

One of the real difficulties in trying to insure that the cooperative education students from other schools get as good a work experience is that the timing and intervals of work are different from school to school. I do not know if it would be possible to coordinate the timing more closely between all institutions offering cooperative education programs, but if somehow it could be, even between schools in the same states or regions, I am sure it would contribute to a strengthening of the overall program.

Another advantage that our GMI program enjoys is closer liaison between classroom and plant instructors, the need for which I cannot emphasize too strongly. That is true even within our own family where GMI students are involved. We need the best qualified employees we can possibly get out of any educational program, including the cooperative one.

Industry and education must be running together more closely to do the job, and the best we can possibly do is with a cooperative program. Even beyond that there is a clear need for closer liaison between industry and education to improve the quality and readiness of students coming out of every educational program at every level. One important way that education and business can cooperate more closely is by trying to forecast the nation's future educational needs. I am not suggesting that either industry or education can see into the future, but that we should sit down regularly, together, to try to look at the future.

Many in industry are willing to take the initiative to improve their relationships with schools, and I encourage educators to take the initiative when the opportunity arises. When people talk about critical relationships in this society they often do not put education-industry relationships at the top of their list, but rather concentrate on industry and government. Maybe we should put industry and education at the top of our list, since it is a critically important relationship, if we are to confront the challenges we face. I am convinced we can overcome those challenges, but industry and education must do a lot more running together in the future, in the broad sense as well as in cooperative education programs in which we each have such an important stake.

SHIRLEY WILLIAMS: Industry cannot really be expected to pick up the full cost of the youngsters straight out of high school because they do very little for the industry of which they are a part. I believe that the only sensible method of trying to finance this is to split the financial responsibility. Government should finance actual allowances involved in the training costs of sustaining the student; the industry should meet the overhead costs of the training place itself, by which I mean management time spent on training or the time of the senior engineer or craftsman spent on training. It is not an unreasonable investment for management to make.

I believe that training costs of that kind should be able to be set off against taxes. In other words, we want a system of tax depreciation for building up human assets on the same parallel lines of the system of tax depreciation for building up capital assets--it is extraordinary that they should be treated differently. Also, the trade unions should not reasonably expect a full adult wage or even a full youth wage to be paid to somebody who is involved mainly in training. That is the position of people leaving high school and entering training positions at work. I mention it because it is more European than American. When it comes to a system of cooperative education, my belief is that industry can be expected to bear the cost providing that the Federal or State government is willing to provide a subsidy when the student requires special help. This includes handicapped students, slow learners and students that need remedial education. Industry should not be expected to bear the full cost of the extra needs involved in training such students.

SALAH AYOUB: Industry cannot accept all of the responsibilities for initiating cooperative education programs. We also should not put the whole responsibility on governments, particularly in developing countries where governments already have too many priorities. The responsibilities of industry should be much greater, then, in developed countries.

Without the involvement of unions we cannot expect a real cooperation, but they will resist any system of which they are not convinced. In many countries training must be administered in training centers or vocational training schools away from industry because it is thought that training is too industry-oriented. This narrow belief reduces the ability of the workers to find other employment if they so wish.

All models of education and training aim at improving the employability of people, enabling them to choose freely their employment, but they do not create employment. They reduce people's vulnerability to unemployment in cases where economic crises exist and they promote self-reliance, self-respect and allow for job and career development.

ROY LONGWORTH: In an attempt to answer the question as to who should take the initiative in trying to develop cooperative education programs, I do not think that you should single out any one of the three sectors mentioned. Cooperation between all three is essential.

I have been involved in cooperative education since 1959. In the last ten years, my institution has been reasonably successful in converting all of its engineering, applied science, graphic design, public health and building surveying courses to the cooperative format. The initiative in Melbourne for that particular process came from the educational institution. We had to preach to and convert local industry, and it was a difficult task explaining what the advantages would be to the companies concerned as well as to the students and the educational institutions.

It would have been easier if we had had some government support, either at state or federal level, but the government has actually been counterproductive in some cases. It looked at our four-and-one-half year engineering cooperative courses and said that since our students are going out to industry and not spending that time in the institution, the government ought to cut our funding. I am still fighting that battle at this time. As far as we are concerned, if we are to do our job properly--the supervision, placement, etc.--by assuring that the industrial component is an integrated portion of the total program, it will cost our senior staff very much money. So this is a problem that I have at the present time in convincing the Federal government that not only should it keep our funding at the present level, but, if it genuinely believes in cooperative education, it ought to increase the funding.

PRESIDENT RYDER: I would like to touch on two last ideas, the first being the concept of secondary-level cooperative education. More than six years ago Northeastern established a special division which was established for the purpose of providing counsel and guidance to secondary schools regarding the ways in which work experience might be introduced into the curriculum of high schools. A significant amount of development had been occurring not only in this area but also in other states. The clear advantage to the society in introducing work experience at an early age should self-evidently promote that concept.

The second idea is that of the concept of cheap labor. From the point of view of the student, wages will never be adequate. But sitting where I do at the moment and seeing students at Northeastern with a total annual payroll of over $50 million--undergraduate students earning $14,000-$15,000 annually and law students getting $25,000 a year for their part-time work in legal firms--suggests that the market really does perform reasonably well and that the students are fairly compensated, especially in areas where there is much demand and where the students can pick and choose. There is no question from the point of view of recruitment that there is a savings to the company. It is unfair to be too critical of industry for exploiting this program solely for its own purposes. As Coleman said, only 20% of the cooperative education students who are trained by Gillette become permanent employees. Other companies have different ratios of experience, but all cooperative education employers provide training for a much larger group of students than will ever serve as future employees, and sometimes to the disparate dissatisfaction of the employer. This happens because the better students have a chance to choose among a variety of opportunities, and they may forsake the employer who has been training them for four years and is looking to them as future candidates. It is a complex world.

DIRECTIONS FOR THE FUTURE

Kenneth G. Ryder
President, Northeastern University
United States

Friends, we are winding down what has been, I think, a memorable conference for all of us. I had a chance to greet you in the opening session, and now I have an opportunity to say a few closing remarks.

From my own point of view, one of the exciting aspects of this conference is the idealism of the people here present, the extent to which they are fully committed to making a difference in the world, combined with a very real sense of realism of the problems and the challenges that face us as we try in effect to combine work and education in a way that will be serviceable to all nationalities and to all countries. The discussion sessions have been provocatively stimulating. The ideas presented have been a challenge. We emerge without clear consensus because the world is too complicated for that at this time in history. But I think we emerge from the conference reinforced with that sense of commitment to the values of cooperative education. Ralph Tyler highlighted in a very effective way those values which his studies have demonstrated. We had better be clear as to the definition of cooperative education--it is not continuing education, it is not a number of other kinds of educational ventures, but it is a clearly defined planned system integrating work experience and classroom instruction.

We discerned, to no one's surprise, the diversity of the world in which we live. We recognize the difficulty of applying similar principles in all areas, or similar structures. We recognize the world as a changing place; there are advanced countries with high technology, while there are other areas of the world which are still in a rural environment and will for many years continue to be dominantly rural. Each group requires special kinds of instruments. We learned from Shirley Williams and Dr. Orfila that there is a common problem of youth unemployment, whether it is in Latin America, where half of the population under the age of 20 is expected to be unemployed for years to come, or whether it is in the advanced countries of Western Europe or the United States, where youth unemployment continues as a major problem.

Through all of this I think we discerned the fact that cooperative education, as we have known it, needs to include work at the level of secondary education, below the college level, because so many people of the world may not get to college. These youths could benefit equally perhaps through programs which combine work experience and formal instruction.

We get a clear challenge that there is a need to work with governments in all parts of the world, to work in ways that will encourage government to be more responsive and understanding of the values of the system which we believe in so strongly, to allow governments to perhaps encourage a longer stay in college. In some of the developing countries it was pointed out that the government tends to be reluctant to finance a longer period of college training so that work can be included. It is clear that government support is needed, especially if cooperative education is to be applied at a level below that of college and higher education, since government uniformly has a responsibility for structuring that level of education.

We received many suggestions of the importance of union support, the need to work effectively, especially in the developing countries, in order to see that union leadership recognizes the value to its membership which is implicit in the opportunities of cooperative education. We received many suggestions that a partnership should be forged between education and the corporate sector; that business and education together have as a common concern the development of interactive support for the cooperative education model; that in many countries, especially in the developing world, transnational corporations must be encouraged to be more sympathetic; that the local manager in a multi-national or transnational corporation really determine the fate or the success of that corporation; and that the responsiveness of the local management must be guaranteed by central administration. We have heard the suggestion that in some cases multi-national, transnational corporations appear too secretive of the special techniques of their industries, and that they must be more open in order to allow the nationals to participate more in the work situation so that they will be fully accepted into the organization.

From the developing countries' side, we were challenged to encourage multi-national corporations to take a financial responsibility for improving the flow of students between countries. Perhaps if cooperative education is to be incorporated as part of the training of students from other lands coming to the United States and other countries, the multi-national corporations should assist with opportunities for cooperative employment in the home country. The after-graduation transition would be easier, and the trained student would not return home as an alien, without a continuing understanding of the special circumstances in the homeland.

Shirley Williams proposed an idea well received by corporation members present that corporations should perhaps receive from governments tax credits, which would recognize that the development of human resources and the investment that corporations put into this endeavor is just as important as the investment in capital resources that frequently are rewarded tax credits. In all countries, developing and the developed, this mechanism for inducing corporate support of educational experimentation is well worth considering.

We learned in one session that in Brazil the government is awarding a tax credit equal to twice the amount of money invested in human resources by a corporation, and while perhaps this is an unrealistic dream, the concept certainly seemed to have great merit.

We have come together, we have talked about common problems, we have recognized that no quick solutions are possible, but I sense too that as we have come together there is a sense of frustration, that this bridge built briefly in two days in Boston might not continue, and the discussions and the information exchanges here may be interrupted by a long delay. And so I am proposing that, for a period of time, until there can be some sort of common secretariat established, an interim staff secretariat be set up through the resources of Northeastern University, in order to provide a central point of information gathering and exchange. We will mail to all participants in this conference a request for reactions, for suggestions, for ideas, both as to future conferences, and more importantly as to what should be done in building a continuing bridge between our several countries and organizations. I do not know what form this organization should take, but I believe from the comments of many that there is a need now to tie together in a more effective way the aspirations, the information, and the goals of people who are commonly engaged in a similar endeavor across this world. We will look to your suggestions and responses, and attempt through the staff at Northeastern for the coming few months to provide an interim bridge which we would hope, by the time of the next world conference, can be in some respects structured so that it is truly representative of all regional organizations, associations, and institutions, so that in the future we will not come together only once every two years to exchange views, but that there can be a growing consensus, a continuing exchange of ideas and problems. We represent collectively a challenge to the previously established order; this is an alternative and different model of education well suited to the current generation and to the emerging needs of the world, and one which is different and which has a long way to go before it is fully accepted as an equal of those classical institutions which have done their job so well in earlier years.

I personally leave this particular conference with a great exhiliration, a sense that we have had participation that is seldom equalled in most meetings which I have attended, and that there is a common purpose, a momentum, a movement which is underway. I thank you for participating. I thank you on behalf of Northeastern for the chance to share in some way in furthering the cause of this interface of work and study which to so many of us represents the wave of the future.

DIRECTIONS FOR THE FUTURE

Lloyd Axworthy
Minister of Employment and Immigration
Minister Responsible for the Status of Women
Canada

PRESIDENT RYDER: It is my very special privilege to introduce Lloyd Axworthy, the member of Parliament from Canada representing the Winnipeg area. He joined the cabinet of Canada this past year as Minister of Education and Immigration, Minister of State on the Status of Women. A former university professor, he has taught at places such as the University of Winnipeg, has an undergraduate degree from the College in Winnipeg, and a Master's and Doctor's degree from Princeton. He is a man of broad vision and deep concern. He is also a man who believes that we should get on with the job. I present him to you at this time for a stimulating challenge to all of us. Honorable Lloyd Axworthy.

DR. AXWORTHY: I would like to share with you an experience which we are going through in Canada, namely some very fundamental questioning about future directions in the whole area of labor markets, employment and education. The basic reason for this, which we came to recognize about a year ago when our government came back into power, is that in this troublesome and turbulent economic and social landscape that we all occupy and in which there has been so much disagreement about economic theories, we have ignored the question of how people work. What is the role of the established institutions in enabling people to work more efficiently and productively in the decades ahead? We have spent a long time talking about capital investment, foreign trade and the macro issues, but haven't spent quite enough time asking ourselves these basic questions which are perhaps critical to unlocking some of the answers.

As a result, last summer I established a major taskforce in my department and can share with you some of the hard political realities that we are facing in dealing with changes necessary for our future direction. First we surveyed the landscape, the present conditions, and tried to cut through some of the current fables about the labor market and the training institutions. I had one basic advantage when I started in that I didn't know what we would find, therefore I was able to bring that great political quality of not being confused by the facts. As we went around the country and talked with a wide variety of groups, certain things became very clear. On one hand we found an increasing shortage of skilled people, and one of the scarcest resources in the world is precisely those people who have talents of mind and hand and can match them up with the jobs that must be done. We in Canada have relied for the last thirty or forty years upon a pool of labor from other countries, namely Europe and parts of Asia. These pools no longer exist, and the other countries are, in fact, turning to Canada in an effort to draw upon our skilled labor. Almost as many people are emigtating now as are immigrating, but it is the skilled people who are leaving because they are now members of a worldwide marketplace. We now face the paradox that while we have increasing demands for skilled labor so that our vast resource projects in western Canada can go ahead, we cannot proceed for the sheer lack of people with the right talents. At the same time, we have an increasingly growing core of men and women who cannot get into the marketplace, or who are in the marketplace in a temporary and inconsistent way. I don't think there is a country in the industrialized world today that isn't facing unemployment rates of 7 to 8 percent, and whether they are the blacks in the United States or the native people in Canada, they are those same people who work for three or four weeks and shift jobs quickly. They are the 5 or 6 percent of our workforce who constitute about 30 or 40 percent of the total weeks of unemployment in our country. It is an astounding figure. It strikes me that the way to break the paradox is to move these people into those opportunities that exist.

Why isn't this happening already? Why aren't those who the economists call the structurally unemployed getting a chance at those new jobs? One thing we found was sheer discrimination in the workforce against women, minority and regional groups. This prejudice is not necessarily overt, some personnel managers have been able to camouflage it; but it nevertheless functions in the way people are hired, trained, promoted and paid. If we are going to make better use of our workforce we must end this discrimination and provide greater upward mobility for those who are confined to the lower echelons of the workplace.

Americans have experimented with the Affirmative Action system and we are now looking very seriously at it. But Affirmative Action is not going to be effective unless we can guarantee employers that the workers who they will employ will have the skills and motivation required. Here we found that in many instances the educational system was not responding either to the demand for the kind of training required or to the fact of discrimination in the workplace.

My own Ministry, which pours hundreds of millions of dollars into a wide variety of vocational training programs across the country, was basically paying for a product that no one wanted, basically paying to keep people in a holding pattern. We must seriously question the allocation of the very scarce and very valuable public resources that we put into training so that we get back far more benefit and maximum punch.

Strong vested interests are concerned, and rightfully so, about any shift in allocation of these resources, and there is no question that people in the educational field are nervous about what government is up to these days. But cooperative education, which we carefully examined in our task force analysis, captures an essential ingredient--the partnership that is emerging between the workplace and the classroom. Our own educational system fails as an effective training ground because these two areas are isolated; the school system is not responding to the demands of the workplace, and the marketplace is not signaling its requirements back to the classroom.

I don't pretend to have easy answers, but we need an on-going set of formulas to effect that marriage between the marketplace and the classroom, and I would welcome further insights from educational establishments as to where they find themselves in the area of apprenticeship training, of medium skills and technology, and even in those areas which are perhaps the toughest to face, finding ways to bring minority groups into the workplace, to stimulate their motivation and to assure them an adequate number of jobs.

Let me give you a case in point. We just finished doing a major analysis of a revolution that is taking place in Canada, the computerization and microprocessing of the office function. This fundamentally affects women, since 80% of the clerical workers are women and there will not be a substantial changeover in that pattern. The answer is not to stand in an ante-diluvian position of saying "Thou shalt not change." The answer is to provide some strong guarantees that women who are now restricted and ghettoized as clerical workers will have the opportunity for upgrading and mobility so that they can take on the new jobs that will be created by that new microprocessing revolution.

But it cannot take place exclusively in the office, nor exclusively in the classroom. There must be a marriage between every major insurance company, government bureaucracy and corporate headquarters, to insure that that vast labor force in the service field has the opportunity to move upward through the system, not to be ejected by the system because someone has established a new teledon or microprocessing screen in front of them.

There is a vast, exciting and unusual opportunity for the educators from all our respective countries not to become part of an autistic trauma, but in fact to begin looking at the kind of changes taking place in the world of work and seeing how the classroom can become an integral part of it. I know I am preaching, in part, to the converted, because that is the nature of your business, but I would like to see how that business could be extended into a much wider variety of occupations. What role does the community college play for the native people of northern Canada as we try to make sure that they get job opportunities in the tar sands of Alberta? We will be spending a hundred billion dollars in energy projects in the west over the next decade. Vast, enormous capital investments with enormous employment demands hindered in part by the lack of skilled labor are sitting cheek by jowl with an Indian population having 70 or 80% unemployment.

I come to you not as an expert in education, but as someone who will be making some hard policy choices in the next year or two. Existing educational institutions will not make them, or cannot make them, so we will find institutions that will. We will go to the employers and to the private sector and insist that they develop their own institutes and centers which we will help fund because we have got to make this happen. We cannot afford the luxury of indulging obsolescence in the way we teach and train. Neither will our economic condition permit it, nor the structure of our society allow it. And that is the political reality that many of you will be facing, not a dead end street by any means, but certainly one with different directions.

How do we translate the peculiar pedagogy of the classroom so that it will merge with the job experience that can only take place on the assembly line or on the office floor? That is a direction that we must go in together. We do have the option of looking at that landscape and doing as many people do, simply mooring the ship on shore, printing lots of advertisements, giving great speeches and then asking the tourists to come aboard and see a historical relic. We can adopt the other method, which is increasingly becoming fashionable in some political circles, of retracing old steps and calling them new directions, or we can, in fact, begin to venture forward, cautiously perhaps, but unquestionably with new navigation, realizing that we have got to launch into new directions lest the world of the workplace will become a world of chaos and disintegrate very quickly, denying to many people their birthright to work. Not only must there be a marriage between the workplace and the classroom, but between these and the cabinet room or council chamber where political decisions are made. This is the nature of the partnership that must take place in order to make our society go to work again.